UGANDA PROTECTORATE

ANNUAL REPORT

OF THE

GAME DEPARTMENT

FOR THE

Year ended 31st December, 1948

PRICE: THREE SHILLINGS

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THE GAME DEPARTMENT

ANNUAL REPORT

For the Year ended 31st December, 1948

SECTION I.—ADMINISTRATION

Expenditure and Revenue

1. Figures are as follow:—

	£
Expenditure	19,868
Revenue (gross)	25,021
Balance of Revenue over Expenditure... ...	5,153

The revenue was derived as follows:—

(*a*) Sale of ivory, rhinoceros horns and hippo teeth ...	19,038
(*b*) Game licences	5,983

Receipts from (*a*) show an increase of 28 per cent., and from (*b*) an increase of 5 per cent.; in the case of (*a*) £18,979 was derived from the sale of ivory.

2. At the two ivory auctions, held at Mombasa, the average price realised per lb. was Shs. 16/05 and Shs. 14/75 compared with Shs. 13/32 and Shs. 11/88 in 1947: an increase in prices respectively of 20 per cent. and 24 per cent.

3. Game and Special Licences issued:—

	1948	1947
Resident's (Full)	303	273
Visitor's (Full)	5	18
Resident's (Fourteen-day)	2	1
Visitor's (Fourteen-day)	2	4
Resident's or Visitor's Two Elephants	26	88
Resident's or Visitor's Third Elephant	13	45
Resident's or Visitor's Three Elephants	8	40
Native's Two Elephants	23	83
Native's Third Elephant	14	35
Native's Three Elephants	7	22
Special for First Elephant	160	...
Special for Second Elephant	100	...
Special for Third Elephant	96	...
Special for One Black Rhinoceros	3	4
Bird	935	932

4. With continued improvement in the ammunition situation, and with an appreciable rise in ivory prices, £302 more revenue has been derived from the sale of licences. Licences to hunt 526 elephants were taken out as compared with 608 in 1947.

5. The total weights sold and prices realised at auction were as follows:—

	Weight	Gross price realised	Approx. average price per lb.
MAY—	*lbs.*	£ *s. cts.*	*Shs. cts.*
Ivory	10,154¼	8,150 17 00	16 05
Rhino horns	31¼	27 18 23	18 00
Hippo teeth	120½	5 15 73	0 96
NOVEMBER—			
Ivory	14,680½	10,828 10 37	14 75
Rhino horns	19¼	23 15 12	25 00
Hippo teeth	16½	0 11 89	0 74

The total of 28,834¾ lbs. of ivory sold is approximately one ton more than in 1947, i.e. an increase of 9 per cent.

6. Ivory, etc.:—

		lbs.
(*a*)	Balance in store at Mombasa on 31st December, 1947—	
	Ivory	7,034¾
	Rhino horns	31¼
	Hippo teeth	81½
(*b*)	Received at Mombasa between 1st January, 1948, and 31st Dec., 1948—	
	Ivory	18,959½
	Rhino horns	87¼
	Hippo teeth	187½
(*c*)	Balance in store at Mombasa on 31st December, 1948—	
	Ivory	1,083¾
	Rhino horns	68
	Hippo teeth	53

	lbs.	*lbs.*
IVORY FIGURES—		
Balance at Mombasa on 31st December, 1947		7,034¾
Received at Mombasa during 1948		18,959½
TOTAL ...		25,994½
Sold during 1948	24,834¾	
Shrinkage or condemned	75¾	
		24,910½
Balance at Mombasa on 31st December, 1948		1,083¾

Illegal Killing of Game and Breaches of Game Laws

7. Illegalities in connection with elephant hunting, the acquisition of ivory, and the selling of game meat have again been prevalent and are widespread.

The high price of ivory is sufficient inducement for law breaking on an extensive scale, and as there are many who share in the profits the necessary evidence to bring cases to Court is rarely forthcoming.

8. Unfortunately, owing to lack of adequate control due to the absence of the necessary supervisory staff, game guards for many years have been able to reap a rich harvest by shooting elephants for African licence holders, retaining for licence holders the larger tusks obtained in the course of control operations, and selling for high prices ammunition otherwise unobtainable by the public.

In Ankole two game guards were dismissed, having previously been given adequate warning, for shooting antelopes and selling the meat.

9. The Protectorate Police have recovered stocks of illegally possessed ivory on a considerable scale: the existence of others is known.

10. *Poaching.*—Systematic poaching in Singo, Buganda, continues. The poachers possess a number of unlicensed, modern firearms, and, in addition, their armament is now being augmented by serviceable, locally made shot guns fashioned from $\frac{3}{4}$ inch or one inch piping.

The results of the war years, when a sadly depleted Game Department staff and an overworked Administration tried to deal with meat-hungry poachers and illegal arms, are still apparent, but with the increasing interest and help of the Administration and Police, the situation is slowly improving.

One District Commissioner redoubled his already keen anti-poaching efforts after himself having fallen into a game pit when on safari!

The ravages of poachers along the Kagera river on the Uganda-Tanganyika border is alarmingly apparent. This area was once the stronghold of eland, roan, waterbuck, reedbuck and topi but few are to be found there now.

Throughout the Protectorate poachers have destroyed game by every possible means—shooting with legal and illegal arms, hunting with dogs, nets, spears and bows and arrows, snares, cart-wheel traps, gins and game-pits. Slowly but surely these are being dealt with but it is a long and difficult task.

Legislation

11. Legislation affecting game was as follows:—

(i) *No.* 3 *of* 1948, *An Ordinance to Amend the Game Ordinance*, which—

(*a*) varies Special Elephant licences and fixes the fees therefor, e.g.:—

First elephant	...	...	Shs. 100
Second elephant	...	...	Shs. 200
Third elephant	...	...	Shs. 300

(*b*) abolishes Native Special Elephant licences which were Shs. 100 cheaper than the non-native Special Elephant licences.

(ii) *Legal Notice No.* 100, which, consequent on (i) (*a*) above, varies the Eighth Schedule to the Game Ordinance, in respect of the precise forms of the various Special Elephant licences.

(iii) *Legal Notice No.* 102, by virtue of which a valuable agricultural area of small extent has been excised from the Lake George Game Reserve, and at the same time an area of equal size added.

(iv) *Legal Notice No.* 142, which re-defines the boundaries of the Lake Edward Game Reserve, which previously had not been clear.

(v) *Legal Notice No.* 143, by virtue of which the hippopotamus, elephant and buffalo are specially protected in the Kazinga Channel, a twenty miles stretch of water linking Lakes Edward and George, and where these large species are abundant.

(vi) *Legal Notice No.* 167, proclaiming the Bulamagi Dam in the Busoga District of the Eastern Province, together with an area of land extending two hundred yards from the dam waters, to be a Bird Sanctuary.

(vii) *Legal Notice No.* 170, which removes the seasonal proteetion hitherto afforded the guinea-fowl in the Lango District of the Northern Province, on the grounds that this bird is responsible for considerable damage to crops.

(viii) *No.* 19 *of* 1948, *An Ordinance to Impose Export Duty on Hides and Skins*, which, *inter alia*, defines "game hide", and exempts from its provisions any game hide certified by the Game Warden to be a genuine sportsman's trophy.

(ix) *No.* 22 *of* 1948, *An Ordinance further to amend the Game Ordinance*, to enable a licensing officer to exercise discretion in the grant of Special licences, such discretionary power already existing in the case of Game licences.

Game Reserves and Sanctuaries

12. *Bunyoro and Gulu.*—There still appears to be plenty of wild life, and in good variety, in this reserve, at least in the vicinity of the River Nile. Trapping on a considerable scale continues, and it is known that some elephant poaching also takes place. An abnormal amount of shooting in defence of visitors making the Murchison Falls trip is referred to elsewhere, *vide* paragraph 220.

13. The construction of a road, just north of the Gulu Reserve boundary, from Anaka in Acholi, to opposite Pakwaeh, on the Albert Nile, may merit an extension northerly of this boundary.

14. Excursions by elephants and other crop raiders northerly into the settled areas of East Madi from the extensive closed sleeping sickness area and elephant sanctuary lying to the north of this reserve have occurred on a moderate scale, and the necessary remedial action has been taken.

15. *Toro* (*or Semliki*).—The Game Ranger reports that poaching in this reserve has decreased since he has been able to make dry season visits by lorry. He further reports that in some parts kob are abundant.

16. *Lake George.*—The remarks made in paragraph 18 of the 1947 Annual Report are equally applicable in 1948, and this reserve is providing more and more abundantly a wonderful spectacle of wild life at the road side.

New and more permanent notice boards, which are a great improvement, have been erected conspicuously along the main roads which traverse the Lake George Game Reserve and the Katunguru–Kichwamba extremity of the Lake Edward Reserve.

17. *Ankole.*—A big herd of eland, many buffaloes, quite a number of zebra, waterbuck and topi, and the usual variety of smaller antelopes, including oribi and klipspringer are to be found in this little reserve. There are also warthog, bushpig, monkeys and many baboons.

18. *Bird Sanctuaries.*—(i) The Entebbe Bird Sanctuary, which is located at the western end of the peninsula beyond the air field, is fairly

well stocked but the geese which used to be a feature of the Veterinary paddocks seem to have moved away.

(ii) *Vide* paragraph 11 (vi) the Bulamagi Dam in Busoga, together with the immediately surrounding land strip to a depth of two hundred yards has been proclaimed a Bird Sanctuary, in order to afford protection to an abundance of interesting waterfowl.

National Parks.—The practicability of the establishment of national parks in certain montane regions is under examination.

Game Trophies

19. Return of tusks from elephants shot by licence-holders:—

District	Under 10 lbs.	Over 10 lbs.	Over 20 lbs.	Over 30 lbs.	Over 40 lbs.	Over 50 lbs.	Over 60 lbs.	Over 70 lbs.	Over 80 lbs.	Over 90 lbs.	Total tusks
Mengo	...	3	45	41	13	5	...	...	...	...	107
Mubende ...	...	...	22	7	9	4	1	2	1	...	46
Masaka ...	...	...	14	3	3	...	...	...	...	...	20
Ankole	...	10	23	20	7	8	1	1	...	...	70
Toro	...	19	51	48	35	19	4	...	...	...	176
Kigezi	...	...	4	8	10	4	4	3	...	...	33
Bunyoro ...	...	6	12	35	26	20	5	4	1	1	110
West Nile ...	1	9	22	17	16	16	7	2	...	...	90
Madi	...	...	...	3	15	2	3	1	...	...	24
Acholi	1	12	24	40	22	15	12	5	6	...	137
Mbale	...	4	2	3	1	...	...	...	...	...	10
Karamoja ...	...	...	2	...	1	5	...	...	...	...	8
Lango	...	...	...	5	1	...	...	...	...	...	6
Busoga	...	2	8	12	4	7	5	2	...	...	40
TOTAL ...	2	65	229	242	163	105	42	20	8	1	877

20. This represents 442 elephants, a 15 per cent. increase on last year (382). One tusk exceeding ninety pounds in weight was obtained. The heaviest pair totalled 180 lbs. There are 135 bulls with tusks of 40 lbs. and under 60 lbs.; 38 of 60 lbs. and under 90 lbs.; and one with a tusk of over 90 lbs. This leaves 268 with tusks of less than 40 lbs. and indicates that at the present rate of taking out elephant licences, the sportsman with a licence for three elephants should make certain of bagging one with tusks of 40 lbs. or over.

21. 115 leopard skins were exported, which is not excessive. It is noteworthy that compensation paid for losses to small livestock from the proceeds of the sale of skins acquired in the defence of property and handed into Government, has resulted in many exaggerated claims, as well as increasing unduly the value of the victims. Even the "shenzi" dog, for compensation purposes, is rated at pedigree prices!

22. Other trophies exported included eleven ostrich eggs, fourteen colobus monkey skins and one blue monkey skin.

23. 5 lbs. of ivory curios valued at £5 18s. 50cts. entered in transit via Mpondwe Customs Post; and 2,538 tusks totalling 74,769 lbs. (just over 33 tons) valued at £42,927 16s. from the Belgian Congo via Butiaba. No trophies entered via Melama Hill, Vurra and Kisoro Posts.

SECTION II.—ELEPHANT CONTROL

24. There is little change in the elephant situation, though freedom from elephant damage cannot be said to have reduced in any way the number of complaints, nor the numerous and insistent appeals for assistance!

25. The estimated total elephant wastage for 1948 is approximately 1,700, a considerable increase on last year. This figure includes allowance for deaths from natural causes, and from poaching.

26. The number of elephants killed by the Game Department staff in the course of organised control activities during 1948, is as under:—

District	No. of Elephants	Male	Female	Tusks	Single tuskers	Total weight
						lbs.
Mengo ...	103	103	...	204	2	2,451
Mubende ...	40	36	4	78	2	1,329
Masaka ...	20	13	7	38	2	450½
Ankole ...	22	20	2	43	1	530½
Toro	248	177	71	482	14	5,003¾
Kigezi	18	18	...	35	1	382
Hoima	21	21	...	42	...	538½
Masindi ...	86	86	...	171	1	2,812
West Nile ...	208	47	161	413	3	4,052
Madi	162	74	88	319	5	3,108
Acholi	28	18	10	52	4	983
Lango	5	5	...	10	...	133
Busoga ...	7	2	5	14	...	203¼
Mbale	2	2	...	4	...	122
TOTAL ...	970	622	348	1,905	35	22,098½

27. The average weight per control tusk is 11·6 lbs., which is a big drop on past eight years' average of 13 lbs. It is probably due to the large number of small elephants which were killed in the course of the reduction campaign in West Nile and West Madi.

28. The following figures represent the number of tusks of below and over 10 lbs. weight obtained in the course of control operations:—

District	Under 10 lbs.	Over 10 lbs.	Over 20 lbs.	Over 30 lbs.	Over 40 lbs.	Over 50 lbs.	Over 70 lbs.	Total
Mengo	95	80	14	11	4	...	...	204
Mubende	31	16	19	6	4	2	...	78
Masaka	20	15	1	1	1	...	...	38
Ankole	15	22	4	2	...	...	...	43
Toro	285	129	53	9	5	...	1	482
Kigezi	25	2	6	...	2	...	...	35
Hoima	15	23	2	2	...	...	...	42
Masindi	69	48	20	25	9	...	...	171
West Nile	243	130	39	1	...	...	...	413
Madi	187	107	19	4	2	...	...	319
Acholi	11	28	6	2	3	2	...	52
Lango	4	4	1	1	...	...	...	10
Busoga	4	6	4	...	...	...	...	14
Mbale	...	...	2	...	2	...	...	4
TOTAL ...	1,004	610	190	64	32	4	1	1,905

29. These tusks include one in excess of 60 lbs., 4 over 50 lbs., 32 over 40 lbs., and 64 over 30 lbs.

30. Found ivory from Control areas:—

District	Under 10 lbs.	Over 10 lbs.	Over 20 lbs.	Over 30 lbs.	Over 40 lbs.	Over 50 lbs.	No. of tusks	Total weight
								lbs.
Mengo	26	40	18	4	3	...	91	1,461
Mubende	2	2	...	...	...	...	4	50½
Ankole	8	4	5	1	...	...	18	249¾
Toro	7	6	...	2	...	...	15	148
Kigezi	11	4	2	2	...	...	19	228½
Masindi	3	4	3	...	...	...	10	122
West Nile	22	10	...	...	...	...	32	277
Madi	29	5	...	...	...	...	34	173
Acholi	7	3	2	...	...	...	12	127
Busoga	4	16	3	...	2	...	25	420¾
TOTAL ...	119	94	33	9	5	...	260	3,257½

31. There was no found ivory from uncontrolled areas. The total found tusks—260, is remarkable when compared with only 98 found in 1947. Having made allowance for the unusually heavy shooting in West Nile and West Madi, it still appears that last year there must have been considerable illegalities in connection with the misappropriation of found tusks.

32. Elephant control continues to be seriously hampered by the lack of the necessary supervisory staff though the situation has improved slightly with the arrival in July of an additional European Game Ranger.

33. Captain R. J. D. Salmon, M.V.O., M.C., was transferred to the pension list at the end of July after twenty-five years' service. At elephant killing he was not only outstanding, but unique. He possessed very definitely a sixth sense, an elephant sense, which enabled him to anticipate what an elephant or elephants would do. His bag runs into thousands of elephants, and his individual performance of 70 elephants killed in three days (*vide* paragraphs 37–38, 1934) is a feat of endurance and skill unrivalled in the annals of elephant hunting.

34. Captain L. T. Gunn's appointment as Game Ranger was terminated in February.

35. One does not wish unnecessarily to repeat the shortcomings of game guards (*vide* paragraph 29, 1946; paragraphs 8 and 34, 1947; and paragraph 8 *ibid.*) which have been previously recorded. Let it suffice to say that bad behaviour due to lack of control is not easily eradicated. One African game guard of long service who was an exceptionally skilful elephant hunter was detected and convicted of offences in connection with ivory over a long period.

One skilled, long service game guard retired at the end of the year.

36. The Asian Ranger who was engaged on a special elephant reduction campaign in West Nile and West Madi during the last three months of 1947, continued his operations very successfully until the end of July, when, being no longer required, his services terminated.

37. It can justly be claimed that throughout the Protectorate the elephant situation is well under control.

Buganda

38. *Mengo.*—Elephants have not been particularly active during the year, damage to cultivation has been inextensive, and raiding herds in the usually affected outlying parts of the District have decreased. Control has been effective, and 62 elephants were killed by the game guards. The total known elephant wastage for the year, including elephants killed by licence-holders and found ivory, is 72 in contrast to 90 in 1947.

This does not take into account losses due to poaching which are particularly heavy in Singo.

39. *Mubende.*—Elephants are still very plentiful; control has been effective and 74 elephants were killed by the guards.

Ivory poaching in this District is also prevalent.

40. *Masaka.*—Reports received indicate that the maximum number of elephants likely to be found in this District at any one time totals 500, distributed as under:—

Mutuba IV, Buddu ...	...	250
Katonga ...	...	...	150
Koki and Mawogola ...	...	100

In the Buddu area the elephants in about eight herds varying in strength from 30 to 60 animals each are resident and frequent the Tero, Namaliga and Malabigambo forests: there are a few good tuskers.

41. It is now a number of years since elephants were resident in the Katonga region, though from time to time considerable numbers appear having apparently been hunted out of the Toro and Mubende Districts. May seems to be the normal month for these incursions, though elephants may appear here at any time in the year. They rarely remain in the District longer than a month, and there are not usually more than two herds which vary from 20 to 100 animals.

42. Into the remainder of the western part of the District elephants infiltrate at various times from two main directions, e.g. across the Kagera into Koki from the forested area around Bushenya, in Tanganyika; and into Kabula and southern Mawogola from Ankole.

43. 22 elephants were killed in the course of control operations.

Western Province

44. *Bunyoro.*—The high light of this year in Bunyoro has been the remarkable freedom from damage by elephants. In the Budongo Forest the number of elephants killed has not been great, totalling 36; in Kibanda which is normally the worst affected area 66 were destroyed. In Bugahya county from where the game guard was withdrawn in August, subsequently until the end of the year only one report of elephant damage was received. The total killed in Bunyoro was 139.

45. The type of frivolous complaint which is often received is well illustrated by a report from one Gombolola that all the game guard stationed there did was to marry and take away new wives, and that he never did any hunting, which was indeed strange as the week before he had shot four elephants within two miles of Gombolola headquarters!

46. One of the most experienced guards when out with the Game Ranger took the spine shot at an elephant which was one of a departing herd. He made a bad shot, the bullet entering the buttock. The elephant moved about 50 yards and stopped, when it was killed with the brain shot. It was found that the guard's original shot had completely raked the elephant, the bullet emerging at the shoulder.

47. *Toro.*—Effective control is not made easier by the scattered nature of settlement resulting in outlying shambas becoming an easy prey to marauding elephants. In the short grass country of Mwenge and Kyaka the inhabitants are able without other assistance to drive away the elephants which enter those areas. Most of the protection afforded has been in Bwamba, Bunyangabu, Busongora and the Muzizi river region in Mwenge. The only place where serious damage occurred was in the Ruwenzori foothills near Bugoye where some banana plantations were destroyed completely.

48. The banana shambas in the Lake Katwe basin became a serious menace in the spread of sleeping sickness, and with the inclusion of this locality later in the year in a game reserve it was decided to withdraw protection.

49. *Ankole.*—Most of the elephants keep to the game reserve and other areas below the eastern scarp of the western rift, though there is a large breeding herd of over one hundred in the Katonga region. Also, two herds of approximately forty elephants each frequent Isingiro close to the Tanganyika–Koki border. 38 elephants were killed in the course of control operations, in the counties of Igara, Isingiro and Buhwezu. The largest pair of tusks obtained on licence were 56 lbs. and 54 lbs., and came from east of the Chambura river.

50. Mr. M. N. Sayer, a European employed by the Consolidated Goldfields, was killed by a cow elephant not far from Kichwamba (*see* paragraph 70).

51. The Kichwamba Fisheries Officer reports that some damage was done to crops in the Bunyaraguru area bordering on the game reserve which he investigated at the request of the Administration. In two instances elephants which had come close to the shambas were successfully frightened away and it was only found necessary to shoot three raiders amongst the cultivation. Of these three, two were bulls which had raided matama plots and had stayed on in nearby thickets. Both had an oily discharge from glands near the temple. One of these elephants had walked through several miles of banana plantations (without doing any damage) to reach a small patch of matama bordered by thick bush and elephant grass. From this cover it repeatedly raided the plot in broad daylight. The elephant was contacted just as it was going back to the thick bush. From the safety of a nearby ridge the local population shouted abuse and threw stones.

The elephant did not seem to mind the shouting but occasionally charged towards where a stone fell. It was shot as it once again made its way towards the matama. The other one was shot in somewhat similar circumstances after it had retired into a small crater containing a patch

of thick forest after raiding crops the night before. The cow elephant was one of five which had for nearly a week raided matama at night and returned to join a large herd in the reserve before daylight. This lot remained longer than usual one morning and the shooting of one was sufficient to keep the others away.

52. A strange happening was when an elephant killed itself by falling into a buffalo pit.

53. *Kigezi.*—Control measures have been confined almost exclusively to the resettlement areas where the four game guards have done most valuable work in keeping the settled areas clear of dangerous and destructive game.

54. On occasions it has been necessary to detail a guard to deal with the herd of forest elephants in Bufundi Gombolola, which are becoming more and more destructive as cultivation extends into what for years has been its normal habitat.

55. Movements of elephants from the neighbouring Parc National Albert into the northern, inhabited parts of Kinkizi have been fewer than usual.

In all 18 elephants have been killed.

There are still big tuskers in the game reserve below the escarpment.

Northern Province

56. *Acholi.*—Elephant control has again been effective, and the amount of damage done by shamba raiders has continued to decrease. The demands for game guards, however, have been numerous, but the craving for meat by the Acholi frequently leads them to imagine damage done to their crops and to support these claims by graphic descriptions of depredations which in fact have never occurred.

There is little doubt that nowadays in all Districts a game guard is no longer regarded as a cultivation protector but from the point of view of a meat provider.

57. The new Anaka–Pakwach road, which traverses the elephant sanctuary, has provided many close-up views of these great beasts, including some fine tuskers, which have been reluctant to move away from the road. Many of them are evidently elephants which never leave the sanctuary as they are not gun shy.

A game guard sent to this locality to deal with the situation successfully moved the elephants without inflicting a single casualty.

The porters working on this road have a wholesome respect for these creatures which have provided them with a much appreciated and genuine excuse for temporary stoppages of work.

58. 64 elephants were shot in the course of control operations. Licence tusks have averaged about 35 lbs., the biggest pair weighing 84 lbs. and 85½ lbs.

59. *Lango.*—Five elephants only were killed by the game guards.

60. *Madi.*—*Vide* paragraph 36 Mr. A. H. Shah Karam was engaged on elephant control in Madi. During the three months February to April

his activities resulted in 179 elephants being killed, mainly in the area Obongi–Nyawa–Sudan border in West Madi. In spite of this very successful campaign considerable damage is still caused to plantations by elephants, particularly in the cotton "block" shambas which are often sited away from habitation.

61. 3,557 lbs. of Government ivory were sent to Mombasa in the course of the year.

62. *West Nile.*—207 elephants were shot, mainly under the direction of Mr. A. H. Shah Karam, and the ivory found of a further 16 elephants. Notwithstanding the abundance of these great, voracious beasts elephant damage in West Nile and West Madi is relatively slight.

63. *Karamoja.*—There have been no control operations in Karamoja where nowadays the elephants, totalling about three hundred, are restricted to the north and north-west. Three licence elephants were shot in this District.

64. Napak mountain was twice visited by a party of elephants from Labwor—in September, and again in December. It is many years since elephants paid this neighbourhood a visit. The duration of their stay, however, was but a few days.

Eastern Province

65. *Busoga.*—There are two or three large herds of elephants in the Gombolola of Kagoma, about 15 miles from Jinja. A visit to this area, a popular one with licence-holders, entails a walk of some eight miles along game tracks. Hunting there is difficult owing to the dense forest and elephant grass which fringe the Nile.

66. In the sleeping sickness area, on the northern shore of Lake Victoria, game generally is on the increase, and includes several herds of elephants which seldom leave the closed area except to make an occasional raid into the Saza of Bukoli. Several 40 lbs. to 50 lbs. tuskers are reported to be in this region.

67. 17 elephants were killed by the game guards.

68. *Mbale.*—There appear to be four herds in this District either as residents or frequent visitors:—

(*a*) In the Gombolola Bukwa, Sebei, where these animals normally frequent the high forest, but occasionally descend into the plains.

(*b*) In the high forest east of Bulucheke in South Bugishu, which probably range well into Kenya. Two elephants from this herd were shot by the game guard in the Bubulu–Butiru area.

(*c*) In the Busitema sleeping sickness reserve, north of the Busia–Jinja road. In November, about 20 elephants were reported to be near the confluence of the Kami and Manafwa rivers.

(*d*) In the Lulonda sleeping sickness area around Lunyo and west of Mjanji on the Lake shore. This herd is numerous, but the main herd is resident in Busoga.

It is difficult to attempt any reliable estimate of the elephant strength in this District as the herds are mainly based on almost or completely inaccessible country.

69. *Teso.*—An unusual occurrence was an incursion by elephants during the first half of the year to the northern area of Amuria from where they were reported by porters engaged on road line clearance.

General

70. *European killed by Elephant.*—An unfortunate accident occurred when a European employed on prospecting near the Hoindagi river, in the Lake George region of Ankole, was returning to his camp one evening. When quite near the camp he apparently saw some elephants on the road along which he was walking. In order to avoid them he left the road and while proceeding up a slope in some forest he unexpectedly walked into more elephants. He had a light rifle with him but was evidently charged and seized before he had a chance to fire it. He was terribly injured and died a few hours later before help or a doctor could reach him.

71. *Capture of Juvenile Elephants.*—1948 has had its quota of unsuccessful attempts to rear in captivity baby elephants. The most interesting was the case of a tiny elephant which was probably not more than 24 hours old when caught as the dry umbilical cord was still attached to it. Although it was looked after and scientifically fed by a Medical Officer it survived only a brief four months. Not long before it died it appeared to be suffering from enteritis to which young animals in captivity are so susceptible. It was observed to indulge in a lot of earth eating which was probably indicative of a deficiency in its diet.

This baby consumed an average of five pounds of dried milk per day, and in addition a daily dose of 45 drops of radiostoleum. As the fat content of elephant's milk is much higher than cow's milk the fat content of the dried milk was appropriately increased: salt was also added.

Young animals in captivity whieh are affected with boils and sores usually respond satisfactorily to penicillin treatment.

72. *Biological Research.*—Mr. J. S. Perry at the end of October completed his research on the reproductive cycle of the African elephant, and during his two years' investigations he was able to examine 114 elephants. Until the material collected has been thoroughly examined in the laboratory the technical value of the investigations will not be known, but in due course the results will be published. As many as seven elephants were dissected in one day.

Mr. Perry discovered incidentally that the skulls and jaws of freshly killed elephants become clean and inoffensive after about a week if left in running water (a stream in a swamp was used).

73. *Recoveries of Illegally-possessed Ivory.*—The police have recovered considerable and valuable quantities of illegally possessed ivory in the Mengo District, and some salutary sentences have been inflicted on conviction of this serious breach of regulations.

74. *Anthrax from Elephant Tusks.*—The following extract from *The Lancet* of the 21st February, 1948, is of such extraordinary interest and importance that it is well worth reproduction.

"Anthrax in man is contracted from infected animals or animal products, so elephant products would be expected to be a potential source of human infection.

75. An unusual case reported from the United States arose in a man of 59 who had been making piano keys from elephant tusks which he cut with an electric saw lubricated with water. The only cleansing to which the tusks were subjected was swabbing the cores with a long-handled sponge soaked in water. The illness began with a small pimple on the face. Within three days the man became progressively ill with chills and fever and on the fourth day he became semi-comatose and was admitted to hospital . . . the patient died five hours after admission to hospital. Necropsy confirmed that the cause of death was anthrax. Preliminary spot sampling of surface areas of whole tusks for the presence of anthrax bacilli was negative, and negative results were also obtained on examination of the cleaning sponge. It is remarkable how seldom anthrax bacilli are found on suspected material. In this case the bacilli were subsequently isolated from the tusks, and the method of obtaining the sample is worth recording. A double bucket was used, the sides and bottom of the inner bucket being perforated. Samples of tusk scraps which had been sawn by the man before his illness were placed in the inner bucket under tap water and brushed. The washings were drained and poured into sterile jugs. In the laboratory the samples were centrifuged and the sediment taken up in about 50 ml. of sterile water. After guineapig inoculation a pure culture of *B. anthracis* was isolated. Some of the guineapigs died early from gas-gangrene infection. An attempt to isolate *B. anthracis* by culture without animal inoculation was unsuccessful.

76. The case illustrates the importance of considering anthrax in the differential diagnosis of cutaneous lesions in workers who handle elephant tusks. It appears that there is no known method of sterilisation which does not alter the physical qualities of the ivory."

77. *Power of Rifles.*—In paragraph 46 reference is made to the high degree of penetration of a ·416 solid bullet in an elephant. Some further instances of the power of this rifle are worth recording.

78. The Bunyoro Game Ranger using a Rigby ·416 rifle took the heart shot at a bull buffalo which was one of a herd all standing close together. At the shot the bull went off with the rest of the herd, but a cow behind him collapsed. She was paralysed due to the bullet having hit her in the neck. The bull originally fired at was found dying about 100 yards away as a result of the heart shot, i.e. two buffaloes with one shot!

79. This Game Ranger also records that in nearly every case of elephants killed with the Rigby ·416 rifle which he has been able to examine, the bullet has gone clean through the animal.

This rather indicates unduly high penetration power which is not altogether desirable for elephant shooting, and it might be preferable for the solid bullet to be slightly more snub-nosed than it is at present.

80. The same game guard who took the spine shot at an elephant has twice killed two buffaloes with one shot when using a ·416. On one occasion the bullet passed through the heart of one buffalo, and clean through the head of a second one, from ear to ear; the other time he took the neck shot and broke the animal's neck, the bullet then carrying on through the heart of a second one and passing out on its other side.

81. This game guard also probably holds a record by killing three buffaloes with one shot with this same type of weapon. The bullet went through the heart of the first, broke the neck of the second, and then into the head of the third passing through the brain and finishing up in the neck.

SECTION III.—NOTES ON THE FAUNA

(A) Mammals

(i) PRIMATES

82. *Gorilla.*—For many years there have been persistent rumours of the occurrence of gorillas at the southern end of Ruwenzori in the region around the higher reaches of the Nyamugasani river. A reliable investigator who endeavoured to elucidate this mystery is convinced that this huge ape does not occur in this locality.

83. According to a reliable report received from the western portion of the Kayonsa Forest in Kigezi an ancient male gorilla shared a water hole with a nearby settlement. He was a cantankerous old gentleman, but not ferocious, and although on several occasions he met water carriers face to face he never attempted to molest them.

84. *Vide* paragraph 133, 1934, the large gorilla troop of twenty or more at that time is now said to total about thirty.

85. *Baboons.*—These destructive pests caused extensive damage to crops in many parts of the Protectorate. Poisoning by sodium arsenite proved to be a very successful method of dealing with them and in the Ruzhumbura and Kinkizi areas of Kigezi a minimum of 288 baboons were destroyed in this manner. Good results were also obtained in Bunyoro and Teso. It should be stressed that sodium arsenite is a very deadly poison which should only be handled and laid by properly trained personnel.

86. *Blue Monkey.*—An immature male specimen of what is believed to be a new species of blue monkey was obtained from the dense forests at the northwest corner of Mt. Kadam (Debasien) in Karamoja, in April, by an Agricultural Officer.

This monkey is locally called "ENYURVI" and the Karamojong say that the males are larger than the females and that the adults are almost entirely black. The British Museum (Natural History) has so far been unable to identify this animal and more specimens are required.

87. *Vervet Monkey.*—The inhabitants of the Sese Islands state that there are plenty of this species (*Cercopithecus aethiops*) on Bukasa Island, the easternmost of the group, but none on the neighbouring island of Bufumira. Further they claim that if monkeys are taken to Bufumira they die. The reason for this has not yet been discovered.

88. In Buvuma, crop raiding by these destructive animals became so serious that an appeal for assistance was made to the Sleeping Sickness Control Unit operating in that area, as a result of which 1,141 monkeys were destroyed.

89. Vervet monkeys damaging forest plantations in Kigezi were virtually exterminated with the use of bananas poisoned with sodium arsenite.

(ii) CARNIVORA

90. *Lion.*—Lions have caused the usual trouble in various parts of the Protectorate by killing stock.

In February, in Bulemezi (Buganda), a game guard succeeded in shooting one after it had killed seventeen goats.

91. In northwest Karamoja at the foot of the Nangaya Mountain a lion family consisting of a male, female, and three almost full-grown cubs were observed in the shade of a large spreading fig tree. The three cubs were up among the branches where one was apparently endeavouring to cache a lump of meat.

92. In Ankole the experimental herd of cattle at Nsongezi was attaeked by lions whieh subsequently moved to Lugaga. One lion was shot by a game guard at Merama Hill and two by a European in Nyabushozi.

93. In West Nile lions did a lot of damage in' Koboko but the culprits were not brought to book.

94. In the Butuku region of the Semliki area of Toro, cattle-killing by lions has become a serious problem. The nature of the country has made it difficult to deal with the culprits and the problem is aggravated by the fact that the local inhabitants have hunted and destroyed nearly all the game in the area thus forcing the lions to turn to cattle-killing. Near Rwebisengo lions mauled a game scout's porter. As the latter was trying to take meat from the lion's kill he had little cause for complaint.

95. *Leopard.*—The protection afforded to these animals in recent years has not yet restored them to their former numbers. As a result both baboons and pigs have increased enormously, and in some parts of Teso it is reported that wild pig have multiplied to such an extent that cultivation is becoming a complete gamble for the local inhabitants.

96. In Kumi County of Teso two Africans walking along a footpath with their dog early one morning were suddenly attacked by a leopard. One man was slightly mauled but when the alarm was raised the leopard left him and jumped into a tree. A large crowd armed with spears, knives and sticks soon collected and advanced on the marauder. Stones were thrown at the animal to persuade it to leave the tree; it suddenly sprang into the crowd and mauled another man before it could be attacked by the infuriated mob and killed.

97. In Bunyoro a man set a trap for pig in his shamba but eaught a leopard instead. He called for another native to assist him and then threw a spear at the animal. The leopard sprang at him but his friend came to his assistance. Both men were badly mauled and had to be removed to hospital. The leopard was later shot.

98. The only reported case of man-eating occurred north of Kamuge in Mbale District early in November when a woman was killed and devoured by a leopard which got away.

99. A Chief in Kigezi shot and killed a leopard which had seriously mauled several men in Nyaruisiza. He thus belied his nick-name of "Piga miss" which he had earned many years ago when, as a Native Administration askari, he failed to hit a raiding Munyaruanda at pointblank range.

100. Four tiny leopard cubs were sent to the Game Warden from Gulu. He looked after them for three months and they turned out to be the most delightful, clean and interesting pets. They were eventually shipped to the Sydney Zoo but unfortunately died on the voyage.

101. At Katunguru (Toro) a marauding leopard killed several goats, which was not surprising as the flocks there are left to graze untended. The raider, evidently a casual visitor, eventually went away. It could have been trapped with local co-operation, but as the African complainants refused to give any assistance whatsoever to the Fisheries Officer he was instructed to do nothing.

102. *Hunting Dog.*—In August twelve of these destructive beasts were shot by a Game Ranger near the Nyamugasani on the border of the Lake George Game Reserve. Poison baits were laid to deal with the remainder but without success as they were all picked up by hyenas.

103. *Otòcyon megalotis.*—The Agricultural Officer, Moroto, collected in Karamoja a specimen of *Otocyon megalotis*, referable presumably to the East African race *virgatus*, the big-eared fox, which is the first record from Uganda of this interesting, nocturnal species. The skin and skull, which were sent to the Game Warden, have been presented to the Uganda Museum.

The Karamojong, to whom it is well-known, call this animal "AMEGURI", and they describe it as a small, dog-like creature with large black ears, moving about in twos or threes, living in holes, and feeding for the most part on white ants.

The Karamojong names for certain other members of the *Canidae* are:—

KWEE ... Silver-backed Jackal.
OLOO ... Side-striped Jackal.
(both the above names are onomatopoeic).
EPEOT ... Hunting Dog or African Wild dog.

(iii) UNGULATES

104. *Buffalo.*—Buffalo control continues to present a serious problem particularly in view of the difficulties in obtaining suitable new rifles and adequate supplies of ammunition. This year again over three thousand buffaloes have been killed through various agencies, but this wastage has made little impression on their vast numbers.

105. As a result of the African Rinderpest Conference held in Nairobi in October, which was attended by the Game Warden, a scheme designed to clear a twenty mile wide buffalo-free belt along the Uganda–Sudan Border for the purpose of breaking the rinderpest link with the Sudan is to be introduced. This scheme, which will be in charge of an Asian Game Ranger, is expected to take five years to complete.

106. In January a Game Ranger visited southern Ankole, at the request of the Forest Department, to drive away buffaloes from areas demarcated for forestry and resettlement schemes. The Game Ranger reported that he found buffaloes in large numbers in the Rivoko and Misumba valleys, in herds as big as two hundred head, but shooting was difficult owing to forests and long grass. Although forty-one were shot this only resulted in the animals being driven from one valley into another. The Ranger stated that he considered that if four hundred had been shot the position would have been just the same. Some big heads were seen in this area.

107. In March assistance was given to the Tsetse Control Department in the shooting up of the Rusozi herd of buffalo in Ankole, as a result of which it was driven northwards towards Ibanda.

In Busoga 345 buffaloes were killed by two game guards.

Tribal hunts have accounted for a considerable number; in Acholi in one hunt alone forty-one were killed.

108. Various fatalities have occurred as a result of encounters with these beasts. In Toro people complained that when hunting pig, at the order of their Chiefs, they were frequently attacked by buffalo. In the Nkoma area twenty men are alleged to have been killed in this manner, but one man who was injured admitted that he had speared the buffalo first. These people are unable to resist the temptation to throw a spear at a buffalo if it appears in a pig drive.

109. In Mubende the servant of a Chief "borrowed" the latter's rifle, a 7 mm. and went buffalo hunting with a friend. He wounded one with two shots but the animal ran away. They followed it and again wounded it with a further two shots but the long-suffering beast again got away. They continued in pursuit until the animal was located for the third time, when one man climbed a tree while the other fired three more shots. The buffalo by this time had had enough and took offensive action—later a policeman had to fire yet another shot at the wounded animal to enable what remained of the man to be recovered. The Chief who allowed his rifle to be used was dealt with in exemplary fashion by the Buganda Government, and was dismissed.

110. A lady tells of her terrifying experience when travelling along the Masindi–Atura road at night. She encountered a buffalo which, in her own words, "bared it's teeth and was about to charge"!

111. *Roan Antelope.*—A herd of fourteen animals of this attractive species is frequently seen in the Kikagati area of Ankole. In this District it is the race *langheldi* which occurs and it is strictly protected.

112. *Eland.*—A herd of sixty has been seen in northern Acholi. Unfortunately, owing to the large quantity of meat this fine antelope provides, it suffers greatly from the depredations of poachers, but in most of the localities in which it occurs it is gratifying to report that it is still holding its own.

113. *Greater Kudu.*—This magnificent antelope, "AMAKUTA" of the Karamojong, is now definitely recorded from Napak (or Mt. Kamalinga),

there having been previously considerable doubt of its occurrence in this locality. One has been seen recently in the southwest corner of this mountain, and three others in the northwest. The Karamojong state that these animals are also to be found on the Nyakwai Hills in southern Labwor, and the horns of one said to have been killed by a lion were found in the region of Munyan, north of the Moroto river.

114. *Lesser Kudu.*—A fine lesser kudu was shot within a few miles of Moroto.

115. *Bushbuck.*—Late one night a large saloon car collided with a bushbuck at mile 6 on the Kampala–Entebbe road. The buck was killed outright and the car sustained extensive damage to the radiator.

116. *Uganda Kob.*—Kob have again suffered heavily as a result of tsetse control and tribal hunts. In the Acholi–Lango area Tsetse Department hunters killed 400 kob during the quarter 1st January–31st March; during the same period tribal hunts accounted for 176.

117. An observer reported having seen what he thought to be an albino kob near the Murchison Falls. These animals, however, are known to vary in the Acholi restricted area from white to roan to almost black.

118. *Mountain Reedbuck.*—A specimen of this uncommon species was obtained on the higher slopes of Napak. The mountain reedbuck is also known to occur on Mt. Kadam and Mt. Moroto.

119. *Jackson's Hartebeest.*—The kongoni has been hard hit by tsetse control operations and tribal hunts. The former accounted for 490 of these animals in the Acholi–Lango area during the first three months of the year. In this area for the same period tribal hunts killed 381.

120. *Blue Duiker.*—The "ntalaganiya", as it is locally called, continues to be persecuted for its soft skin which is much in demand for making karosses. A Ranger in the Western Province discovered that they were being trapped and the skins sold for as little as twenty cents each. Poaching of this sort is difficult to eradicate.

121. *Bush Pig.*—A Fisheries Officer while proceeding by launch from Katunguru towards Lake George one morning came across a bush pig near mid-channel swimming towards the Ankole shore. Its method of proceeding through the water was unusual, as, with its back above water, it moved with its head completely submerged. At intervals of about fifteen seconds it stopped paddling, lifted its head, took a deep breath and started off again. It was thought at the time that it might be injured, so the launch was taken alongside and one of the crew instructed to put a rope round it. This he did very expertly by lassoing the animal at the second attempt, and no doubt with visions of pork. There was found to be nothing wrong with this pig which, with open mouth, demonstrated by lunging at the man holding the rope that it was full of life. After taking some photographs it was turned loose in the water to the disgust of all the Africans aboard. It was last seen swimming strongly towards the Toro shore from which it probably started its swim.

122. The usual intensive campaign against the bush pig wherever this destructive species is numerous continues to be carried out mercilessly, but without making much impression on its ravaging hordes.

123. *Hippopotamus*—Throughout the waters of the Protectorate the hippopotamus continues to thrive, although a certain number have had to be killed in defence of property and others have been poached for the value of their meat.

124. A few have been shot in Lake Mutanda in southwest Kigezi for damaging cultivation, but as this big creature is beneficial to the economic fisheries by fertilising for plankton growth the shallow waters in which it lives, the local Native Authority has been advised that only a very few should be destroyed.

125. In the Nile from Pakwach to Nimule, where they are not protected, the usual large numbers have been speared by the local Africans.

126. In September a hippopotamus had to be shot at the Murchison Falls by a game guard in charge of a party of visitors, when one of them disobeyed his orders and went baek to take a photograph of the animal after being warned to move away. The result of this folly was that the game guard had to kill the infuriated creature in defence of the party.

127. Although, in Busoga, 95 hippopotamuses were destroyed by game guards, these animals still wander freely over the Jinja golf course, but usually in the early small hours, unseen and unmolested by the inhabitants.

128. One fisherman was drowned when a hippo upset a canoe in the Kazinga Channel. Two old hippos which would probably have caused a similar tragedy were shot at the Katwe landing.

A game guard was twice sent to Kome to deal with an aggressive hippopotamus which was interfering with fishing canoes. This was at the urgent request of the local Native Authority, but on neither occasion could the beast be located, mainly because the local inhabitants refused to afford any assistance.

129. The Kichwamba Fisheries Officer had an unpleasant experience when, on going ashore on one occasion, the launch unintentionally separated a mother hippo from its very young calf. The mother at first dashed away in alarm bellowing loudly but returned a few moments later when its youngster started to squeal. After finding it could not get round the boat the enraged animal started to butt the port bow and then tried to get into the launch. On being prodded in the snout with the end of a rifle barrel it moved away a few yards where, fortunately, it remained until the crew were able to start the engine and back the launch away. The hippo then joined its youngster, but still seemed very upset as she continued snorting and making a lot of noise after the launch had left.

130. At Entebbe, off the Botanical Gardens' shore, a hippopotamus was accidentally enclosed in a seine net. The animal was not in the least perturbed, and when the net arrived near the land it calmly stepped over it and regained deeper water!

131. *Recording of Hippos Bellowing.*—An American visitor who wanted to obtain a sound recording of hippos "shouting defiance at each other" was given an opportunity of fulfilling his desire in the Kazinga Channel area. When it was getting fairly late he was taken to a small bay in which there were about 100 hippos. The visitor hopefully set up his

outfit within a few yards of the nearest hippo but the animals just snorted at him. However, he was persuaded to wait quietly, and out of sight. After a while a hippo bellowed and was answered by another and a short recording made, then the animals became quiet again. It was then suggested that the recording of these two hippos be played back at them. This did the trick and was an immediate success, as it started all the hippos bellowing in return and as soon as the chorus eased off the recording was played back to start them off again.

132. *Hippopotamus Fat.*—A sample of hippopotamus fat was sent to Cambridge for analysis.

133. *White Rhinoceros.*—This strictly preserved species continues to thrive, almost unmolested, in West Nile.

In April, however, ten men were arrested for killing a white rhino. When tried at Arua they claimed that the animal had attacked them and they had to kill it in self defence. They were acquitted.

134. In September a Game Ranger on safari in West Nile reported much spoor in a swamp northwest of Laufori. He also saw four white rhino which he stated appeared to be quiet and docile and although they got his wind they walked off quite happily.

In October the Ranger reported that the white rhino had moved away from their normal habitat in the region of Rhino Camp, probably as a result of the increased population.

135. *Black Rhinoceros.*—Several incidents occurred to maintain the popular reputation of this animal as a stupid but dangerous nuisance and the usual yearly quota has had to be destroyed.

136. In January an Indian Tsetse Ranger in Acholi was charged by a pair of rhino when travelling with his porters along an elephant track through high grass. The Ranger stood his ground and waited for a clear shot at close range, but at the last moment the first rhino swerved to follow a running porter and with other porters in the line of fire the Ranger was unable to shoot. The second rhino, a young beast, was speared by the porters and finally shot as it charged a tracker. In the meantime the first rhino had succeeded in tossing and badly injuring one man before disappearing into the grass with its horn entangled in the sling of a spare rifle which the man had been carrying.

137. In Acholi, in May, a couple of rhino attacked the camp of a pair of Tsetse Department hunters at midnight when they were sound asleep. Roused by wild yells they emerged from their tent with their rifles and saw the two rhino stamping on the fire and charging towards a yelling porter who had slept by the fire to dry meat. They both fired causing the rhino to swerve thus saving the man. The beasts continued to be aggressive and the hunters had to fire again to stop another charge. The next day, although a quantity of blood was found the wounded animals were not traced. The porter was untouched by the rhino but was badly burnt by the fire which had been kicked over him by the charging beasts!

138. A Tsetse Department officer had an unpleasant experience on the Kacheri Range in Karamoja in May, when his party was cornered in a narrow, rocky valley by three rhinos. He managed to shoot the bull

and the cow, at close range, when they charged and finally persuaded the calf to retire. The rhino in this area appear to be very aggressive and invariably take umbrage at being disturbed.

139. A series of eyes collected from black rhinoceros, killed during tsetse control operations, have been sent to an investigator in Tanganyika.

140. *Giraffe.*—Every year a few of these animals are poached for the sake of their tails.

141. In June two Tsetse Department hunters were convicted for illegally shooting a giraffe in Acholi. They were sentenced, by the native Court, to pay a fine of sixty shillings each or six months imprisonment. The fines seemed little enough since the Acholi say that as many as twenty hoes are exchanged with Sudanese for a giraffe's tail and in Karamoja their current value is said to be one full-grown ox.

142. In September reports were received of a herd of giraffe on the East Madi bank of the Nile with three animals very much darker than the rest. Old giraffe males are often very dark, sometimes liver colour.

143. *Zebra.*—This gaudy animal appears to be holding its own in the areas to the north and south of the Katonga river, and also on the Sebei plains.

(iv) TUBULIDENTATA

144. *Ant Bear.*—A pair of ant bears fell into a shallow well close to the Lia river below a house at Moroto in Karamoja. The female was drowned but the male was hauled up with the aid of ropes. He was obviously very tired and hungry and after being photographed was released. He made slow progress at a clumsy canter, in bright sunlight, until he reached the undergrowth when he greatly increased his speed and eventually went to ground. It is thought that the male was probably pursuing the female preparatory to mating until the accident brought their love-life to a sudden and tragic end.

It is reported that the male was very "photophobic"!

(v) NOMARTHRA

145. *Ground Pangolin or Scaly Ant-eater* (*Smutsia temminckii*).—A specimen of this curious creature was collected in West Madi by the scientist who is engaged on elephant biological research.

(vi) RODENTIA

146. *Anomalure or African Flying Squirrel.*—A specimen of this uncommon forest species was collected in the western Kayonsa Forest by Mr. P. O. Matthews when a large tree about 100 feet high was felled. The skin, skull and skeleton were sent to the Game Warden and these have been presented to the Uganda Museum. Formerly in this locality some ten years ago and more, it is said that this little creature was the Batwa dowry given by the aspirant swain to his father-in-law to be: nothing else won him a wife.

147. *Ground Squirrel.*—The common ground squirrel *Euxerus erythropus lacustris* is out of favour with the Forest Department at Kachung (Lango) where it digs up and eats the seeds of *Gmelina arborea* in the forestry nursery.

148. *Rodents.*—Rodents at Muko, at the northern extremity of Lake Bunyonyi in Kigezi, have been causing extensive damage in forestry plantations by barking cypress trees to a height of two to three feet above the ground. Rodents trapped in these plantations which may be the culprits are *Lophuromys sikapusi ansorgei* and *Lophuromys aquilus.*

(B) Birds

149. *Rosy Pelican* (*Pelecanus onocrotalus*).—This pelican, generally, has been as plentiful as ever on Lake Edward and Lake George. It has been calculated that the harm it causes the economic fisheries is of truly staggering proportions, but this is referred to in paragraphs 315 and 432 to 438 of the Fisheries Section of this Report. A local breeding ground of this species has yet to be discovered.

150. *Pink-backed Pelican* (*Pelecanus rufescens*).—The feeding habits of this species are referred to in paragraphs 315 and 434 of the Fisheries Section of this Report.

151. *Goliath Heron* (*Typhon goliath*).—This fine heron breeds commonly in the vicinity of Lakes Edward and George. It is not a communal breeder, though several nests may be found on one small island. Most of the nests are not readily accessible, placed as they are on top of spikey *Euphorbias.* In this locality the breeding season extends from September to January.

152. *Night Heron* (*Nycticorax n. nycticorax*).—This species is either uncommon or else extremely local as it is rarely encountered. One was seen on the Kazinga Channel in November.

153. *White Stork* (*Ciconia c. ciconia*).—Two white storks which had frequented Masaka golf course for several weeks were still there at the end of May.

154. *Open-bill* (*Anastomus lamelligerus*).—Although flocks of open-bills totalling about 300 birds were seen in the vicinity of mile 60 on the Kampala–Masaka road during June, July, August and September no breeding colony was located although these are the usual nesting months.

In Busoga, a small breeding colony was reported in a very tall *mvule* tree which contained young birds in August.

155. *Saddle-bill Stork* (*Ephippiorhynchus senegalensis*).—In April a pair of these storks were reported nesting near Nakatanda on the Ankole side of the Kazinga Channel. The nest, which was a large one measuring some 9 ft. by 6 ft., was in a flat topped *Euphorbia* about 25 ft. off the ground and 20 yards from the water. No eggs were seen until 5th June when a Fisheries Officer visited the nest and found one of the birds incubating three eggs. Unfortunately the sitting bird deserted and four days later it was found that the nest had been abandoned notwithstanding the fact that the eggs were on the point of hatching.

This is the first authenticated record of the breeding of the saddle-bill stork in Uganda.

156. *Marabout Stork* (*Leptoptilos crumeniferus*).—There is no diminution in numbers of this odd-looking bird at the Katwe and Katunguru fish landings on Lake Edward and the Kazinga Channel.

An egg laid casually on the ground was found at Katwe on 20th November.

157. *Yellow-billed Stork or Wood Ibis* (*Ibis ibis*).—This is a fairly common species in the Lake Edward, Lake George and Kazinga Channel region, though no breeding colony has yet been located. However, a young bird brought in by a local African during 1947 was kept for some time as a pet at the Kichwamba Hotel.

158. *Glossy Ibis* (*Plegadis falcinellus*).—Fifteen were seen in November on Kyazanga dam some 32 miles beyond Masaka on the Mbarara road. They were all young birds, and it is believed that they had probably been bred in Uganda.

159. *African Spoon-bill* (*Platalea alba*).—A small flock of this odd-billed bird was observed in August at Rwensama on the Kigezi shore of Lake Edward.

160. *Lesser Flamingo* (*Phoeniconaias minor*).—The lesser flamingo has been an occasional visitor in small numbers on various saline lakes in the western rift. Breeding has not been attempted.

161. *White-backed Duck* (*Thalassornis leuconotus*).—The white-backed diving duck is a common and breeding species on most of the larger dams in the Masaka District.

162. *Black River Duck* (*Anas sparsa*).—The black river duck is an occasional visitor to Lake Nkugute, at Lutoto, in western Ankole.

163. *Knob-billed Goose* (*Sarkidiornis melanonota*).—The knob-bill is a common species on most of the larger dams in the Masaka District. At times on the Kyazanga dam it is abundant. Where it breeds is still a mystery.

164. *Egyptian Goose* (*Alopochen aegyptiacus*).—The handsome and noisy Egyptian goose is very common in the Lake Edward, Lake George and Kazinga Channel region, and is particularly abundant and tame at Rwensama on the Kigezi shore of Lake Edward. On Lake George one was found breeding in an old fish eagle's nest fully 80 feet above the ground.

165. *Fish Eagle* (*Cuncuma vocifer*).—This magnificent eagle with its unmistakable clanging cry is a very common species in the Lake Edward, Lake George and Kazinga Channel region where it nests from August to December. Young ones make interesting pets; for some time a large juvenile was kept at the Kichwamba Hotel where it enjoyed full freedom. Near a western Ankole crater lake a fish eagle's nest was overlooked by a cliff from which it was possible to learn much about the home life of the eaglets.

166. *Vulturine Fish Eagle* (*Gypohierax angolensis*).—Several specimens of this handsome, piebald eagle frequent Lake Saka (near Fort Portal) where this species undoubtedly nests. It is rare in Uganda.

167. *Lammergeyer or Bearded Vulture* (*Gypaëtus barbatus meridionalis*).—A Rockefeller Institute research worker has identified this magnificent bird at the northern end of Ruwenzori.

168. *Stone Partridge or Rock Bantam* (*Ptilopachus petrosus emini*).—A nest of this interesting little rock fowl containing four eggs was found in south-eastern Acholi on 30th December. It is said to be abundant on all rocky hills in Karamoja.

169. *African Crake* (*Crecopsis egregia*).—A specimen of this skulking species, which Jackson writes "is a rare bird in collections," was collected near Katwe (Lake Edward) in September.

170. *Little Reed Hen* (*Porphyrula alleni*).—Although widely distributed, this small waterfowl owing to its shy and retiring habits is rarely seen. A live specimen, caught in the Nabajuzi river in mid-May, was brought into Masaka: it escaped after one day in captivity. A few pairs were observed on the Ntusi dam in the same District.

171. *Lesser Moorhen* (*Gallinula angulata*).—This is another of the less known species of waterfowl which is probably more common in Uganda than is apparent, for it is possibly often confused with its larger relative the African moorhen. A few pairs were seen on the Ntusi dam in the Masaka District.

172. *Peters' Finfoot* (*Podica senegalensis petersi*).—This odd-looking aquatic species, appearing half duck and half cormorant, is widely but very sparingly distributed. Except by the ornithologist it is unlikely to be recognised. One was seen in November on the Kazinga Channel.

173. *African Jacana or Lily Trotter* (*Actophilornis africanus*).—In August, an amazing concentration of at least two hundred lily trotters was seen on *Pistia stratiotes* (Nile cabbage) in a tiny lagoon at Rwensama on the Kigezi coast of Lake Edward.

174. *Jackson's Greater Bustard* (*Neotis cafra jacksoni*).—This fine bustard is common in the region where the Districts of Karamoja, Lango and Acholi all meet. Its main breeding season is during the latter half of January and in February, and it appears that it lays only one egg.

175. *Kitlitz's Sand Plover* (*Charadrius p. pecuarius*).—This delightful little plover which breeds in suitable sandy localities along the shores of Lake Victoria was found breeding in September on the Lake George shore.

176. *Black-winged Stilt* (*Himantopus h. himantopus*).—This comic-looking wader was found breeding near the Kaianja lagoon (Lake Edward) in June. It had also bred about the same time at Rwensama on the Kigezi shore of Lake Edward, where juveniles were seen in August.

177. *Snipe*.—Large numbers of snipe are reported to have appeared on Kyazanga dam in Masaka District in October; this is early for their annual southerly migration which usually is intensive during the full moon at the end of November or in early December.

178. *Painted Snipe* (*Rostratula benghalensis*).—This curious wader which where it occurs is conspicuous by its almost owl-like flight is probably more common than is generally thought. It is resident on the Kyazanga dam in the Masaka District where it breeds when conditions are favourable, it also occurs at Lake Nakavali in southern Ankole and probably breeds. But its main strongholds appear to be Rwensama on the Kigezi shore of Lake Edward, and Kinyampidzi near the Kaianja lagoon in Toro, also on Lake Edward. In this latter locality it was breeding in the latter part of June and in early July. It also occurs sparingly at Katwe salt lake, but it is not known whether it breeds there.

179. *East African Pratincole* (*Glareola pratincola fülleborni*).—This dainty little bird, sometimes aptly called the swallow plover, breeds in

June on the shores of Lake Edward at Rwensama (Kigezi) and Kinyampidzi (Toro). So far the eggs have not been found locally, though intrusion on to a breeding ground is at once apparent by the fantastic display of feigning wounded and crippled birds indulged in by the parents to divert attention.

180. *Stone Curlew, Thick Knee or Water Dikkop* (*Burhinus v. vermiculatus*).—This odd-looking species which frequents the dry shores of the Uganda lakes usually advertises its presence by its weird, plaintive call, and it is particularly noisy in brilliant moonlight. On Lake Victoria it has a definite association with crocodiles, and where these loathsome monsters breed there too will be found the nest of *vermiculatus*, the eggs often lying on the ground within a few feet of a brooding saurian. At Rwensama (Lake Edward) a dikkop's eggs were found in the centre of an old heap of elephant droppings; near Lake George a dry buffalo "pat" was used for a similar purpose.

181. *Scandinavian Lesser Black-backed Gull* (*Larus fuscus fuscus*).—On 2nd July an adult *Larus fuscus fuscus* was brought in alive near Bundibugyo, in Bwamba, western Toro, to a member of the Swedish East African Expedition. As it was ill and weak it was turned into a scientific specimen. On one leg it carried a ring which is referred to in paragraph 194.

182. *Gull-billed Tern* (*Gelochelidon nilotica*).—In August several hundreds of this beautiful tern were seen at a lagoon at Rwensama on the Kigezi shore of Lake Edward. It is possible that they may have been breeding a little earlier in this neighbourhood, but none was examined for sexual activity.

183. *Milky Eagle Owl* (*Bubo lacteus*).—This huge owl breeds freely in Entebbe and juveniles strong on the wing and capable of looking after themselves usually appear in November. In the Lake Edward, Lake George and Kazinga Channel area brooding birds have been seen on eggs on top of old hammer-head stork nests or in fish eagles' nests in July and August. A juvenile nearly able to fly was found in an old eagle's nest by the Kyazanga dam on 10th May.

184. *Duck and Geese.*—Duck were seasonally plentiful on Kyazanga, Nabitanga, Namimbi, Kyebondogoto, Matete, Ntusi and Biwolobo dams in the Masaka District, on various dams and lakes in Ankole, in Busoga, and on the dams in the Teso and Lango Districts.

Spurwing geese were reported in large numbers in the neighbourhood of Mugoya on Bugaba Island of the Sese group.

185. *Black Bee-eater* (*Melittophagus gularis australis*).—Specimens of the black bee-eater, a species not hitherto recorded from Uganda, were collected in Bwamba, western Toro, and in May this handsome species was observed to be nesting in the banks of some of the small streams which are crossed by the road to Bundibugyo.

186. *Honey Guide* (*Indicator spp.*).—The Fisheries Officer who was billeted at Kichwamba Hotel reported that a honey guide, probably the large, black-throated species, came on several consecutive days to eat

beeswax out of a cigarette tin which had been left on the verandah. He got snaps of the bird while it was perched on the edge of the tin, and with its head deep down in the tin. This record suggests that the honey guide may be primarily interested in eating the wax of a honeycomb, which one would imagine normally to be quite indigestible. But what is of exceptional interest is how the bird found the wax. The nearest tree was some distance away and the bird could not possibly have *seen* it; if it found it by scent the bird must have quite an uncanny sense of smell!

187. At the end of the year, at Entebbe, the Game Warden noticed a scaly-throated honey guide (*Indicator v. variegatus*) eating the wax of an abandoned wild bees' comb right inside a wood shed.

188. *Teso Golden-crowned Weaver* (*Ploceus spekeoides*).—In the course of working through the study collections at the British Museum (Natural History) the authors of the most up-to-date text book on the birds of Eastern Africa, at present only in the stage of compilation, came across an undescribed large type of yellow weaver which had been collected many years ago at Nariam and Usuku in eastern Teso. It is a Golden-crowned form, closely related to *Ploceus spekei*, which the authors proposed to name *Ploceus spekeoides*. The Department was asked to co-operate, as opportunity offered, by collecting further specimens of this new weaver bird. A senior fish guard, who is a trained bird skinner, was instructed to try and collect a series of this weaver when he was sent in June to investigate the Teso dams. Quite unexpectedly he managed to procure a fine series of both males and females which sufficed to confirm that the suspected novelty was in fact valid. These birds were found in small colonies associated with the slightly smaller species *Ploceus h. heuglini*, which *P. spekeoides* somewhat resembles, and nesting invariably on trees right out in the water of the dams. Although there was furious nest-building activity, egg-laying had not started when the fish guard left the locality at the end of June.

189. When the Game Warden visited these dams in the latter part of November, none of these birds was seen although there were plenty of abandoned nest colonies both in Teso and on some of the eastern Lango dams.

190. *Masked Weaver* (*Ploceus h. heuglini*).—When collecting the new weaver *P. spekeoides* the opportunity was taken of obtaining a long series of the closely associated and more plentiful *P. heuglini*, a species which is poorly represented in the National collection. In eastern Teso egg-laying was commencing at the end of June. None was seen when the Game Warden visited the locality in the latter half of November.

191. *Bwamba.*—Several scientific expeditions have collected many ornithological novelties in the little explored Bwamba forest in western Toro, thereby adding at least two dozen interesting and hitherto unrecorded species to the Uganda list.

192. Passing reference only is made to these discoveries which it is hoped will eventually be the subject of a special supplement of the *Uganda Journal*. Let it suffice to mention that these novelties include several species of hornbills and fly-catchers, sunbirds, warblers, chats, a roller, a diminutive long-tailed starling, the lovely forest pigeon *Columba albinucha* and the lovebird *Agapornis swinderiana*.

193. *Rwensama.*—The shores and swamps of Lake Edward, Lake George and the Kazinga Channel, and the saline craters in this neighbourhood are all noted for their varied and abundant bird life, so when it is claimed that one swampy lagoon of little extent is outstanding in this respect it must be realised that the bird life there is literally profuse. Rwensama on the Kigezi shore of Lake Edward is well worth a visit in July, August and September by any nature lover for its concentrations of birds in great variety have to be seen to be believed. Some are referred to in the preceding ornithological notes.

194. *Co-operation with European Bird-Marking Stations.*—No rings were recovered from white storks during the year. An example of the Scandinavian Lesser Black-backed Gull (*Larus f. fuscus*) was found in Bwamba, western Toro, on 2nd July with a ring marked:—

T7775 . Particulars of when and where this gull was
RIKS MUSEUM ringed have not yet been received.
STOCKHOLM

195. Since the last Report (*vide* paragraphs 176–177) details of seven more white storks bearing Rossitten rings (recorded in 1947 Report) have been obtained, as follows:—

Ring No.	Date	Locality where ringed
BB 12284 ...	1938 or 1939 ...	District of Cottbus, Province Brandenburg, Germany.
BB 11494 ...	June or July, 1939...	Province Oberschlesien, Upper Silesia, Germany.
BB 8325 ...	1936, 1937 or 1938	District of Stolp, Province Pommern, Pomerania, Germany.
B 66286 ...	28th or 29th June, 1939 ...	District of Samland, East Prussia.
B 76008 ...	1940 ...	Ortelsburg, East Prussia.
B 65658 } ...	1938 (two rings) ...	District of Trebnitz, Silesia.
B 65659 }		
B 65171 } ...	1939 (two rings) ...	"Burgenland" part of Austria.
B 73408 }		

All these birds were ringed while still in the nest.

196. The Rossitten bird marking station of pre-war days has been replaced by the new Radolfzell station.

197. The following information has been received from P. Skovgaard of Viborg, Denmark, concerning certain of his rings recovered in Uganda:—

Ring No.	Annual Report reference	Date	Locality where ringed
R 4954 ...	(1935, para. 309) ...	30-6-32 ...	Askov, Vejen, S. Jutland, Denmark.
R 6187 ...	(1936, page 31) ...	? ...	Vejen District, S. Jutland, Denmark.
R 3848 ...	(1947, page 29) ...	June or July, 1937 ...	Spanggaarde, 20 km. north of Viborg, N. Jutland, Denmark.

These three birds were ringed while still in the nest.

198. The following details have been received of white storks and other species whose "Helgoland" rings have been recovered locally; unless otherwise stated all the birds concerned are white storks:—

Ring No.	Annual Report reference	Date	Locality where ringed
221954 ...	(1936, page 31) ...	10–7–36 ...	Oster-Ihlienworth, Hadeln, Hanover, Germany.
227374 ...	(1939, para. 74) ...	25–6–39 ...	Bergenhusen, Sehleswig, Schleswig-Holstein, Germany.
221175 ...	(1947, page 27) ...	6–7–38 ...	Wehrdex, Elsfleth, Oldenburg, Germany.
222877 ...	(1947, page 27) ...	Records lost during the war.	
221524 ...	(1947, page 27) ...	28–6–39 ...	Kellinghusen, Steinburg, Schleswig-Holstein, Germany.
218773 ...	(1947, page 27) ...	2–7–39 ...	Holzhausen, Osterburg, Magdeburg on Elbe, Germany.
311780 ... Black kite.	(1947, page 28) ...	24–6–36 ...	Leipzig, Saxony, Germany.
222769 ...	(1947, page 28) ...	7–7–40 ...	Salzendeieh, Elsfleth, Oldenburg, Germany.
H 297 ...	(1947, page 28) ...	25–6–39 ...	Bremen on Weser, Germany.
221709 ...	(1947, page 29) ...	6–7–35 ...	Frischenmoor, Brake, Oldenburg, Germany.
H 352 ...	(1947, page 29) ...	26–6–36 ...	Arsten, Bremen on Weser, Germany
229065 ...	(1947, page 29) ...	5–7–45 ...	Bergenhusen, Friedrichstadt, Schleswig, Schleswig-Holstein, Germany.

199. These birds were either ringed in the nest or while still juvenile:

Ring No. 311780 when originally received was said to have come from a "black stork".

Ring No. 222769 is from a white stork ringed in the early part of the war; ring 229065 is from one ringed in the latter part of the war.

H 352 is from a white stork which was 9½ years old, and is the oldest bird from which a ring has so far been recovered in Uganda.

200. (i) Details of the ringing of Budapest 115597 (1937, page 29) are that it was ringed as a nestling at Komjati, N.E. Hungary, on 9-7-1935.

(ii) With reference to Paris Museum ring B 6723 (1947, page 28—No. 13 in 1941 list), this white stork was ringed as a nestling in June, 1940, at Bordy, Bou, Arreridy, Constantine, Algiers, North Africa.

(C) Reptiles

201. *Python* (*Python sebae*).—The python each year can be relied on for a good story, and this time it is the Game Warden's wife who can provide an experience which subsequently she had to record for an American broadcast. A well shaded heap of cattle manure is one of a gardener's most cherished possessions, but it also has that nice warm temperature beloved of reptiles for incubating their eggs. It is rather terrifying to find coils of python instead of manure wherewithal to fertilise a garden, which was the lot of this luckless lady. The wretched python, which had to be shot as it could not be captured, measured 10 feet 3 inches.

202. Pythons abound along the swampy shores of Lakes Kyoga and Kwania in the Eastern Province, and some enterprising residents have taken advantage of their abundance to foster a trade in live pythons. Unfortunately, there is not an unlimited demand for live pythons, and where these great reptiles are so plentiful it is soon possible to flood the market and kill the trade, which was the inevitable fate of this venture. Pythons up to a length of 10 feet were caught and handled with little difficulty.

203. An eight feet python was caught in a five-inch mesh net in the Kazinga Channel near Katunguru. In its struggles to free itself it became well and truly entangled.

204. *Royal Python or Ball Python* (*Python regia*).—This is really a West African species which only occurs along the western edge of Uganda. The first authenticated record of its occurrence is a specimen which was obtained at Laufori, in West Madi, by the elephant research biologist. Subsequently, another reliable record was received from the Semliki valley, at the forest edge in Bwamba. The royal python is a small species which rarely attains a size exceeding five feet. When first handled or frightened it is apt to coil tightly into a compact ball, hence one of its popular names.

205. *Scaphiophis albopunctatus*.—No popular name seems to have been given this harmless species, though from its very pronounced spade-like rostral, which produces an almost beak effect, it could appropriately be called the shovel-headed snake. It is a burrower which is not particularly common though plentiful in the foundations of the Catholic Church at Budini, near Kaliro in Busoga. The elephant research biologist collected a fine example at Laufori, in West Madi. Other specimens are recorded from Serere and Soroti, and from Lango, and it would appear that this species which normally reaches a length of 3 to 5 feet is mainly found in the drier eastern and northern parts of the Protectorate.

206. *Fatalities*.—An African student at the Survey Training School at Katabi, just outside Entebbe, died from snake bite. The snake concerned is believed to have been a puff adder.

Human fatalities in Busoga due to snake bite were reported to total twenty-four.

207. *General*.—Snakes for identification have been received from the Congo Belge, south western Sudan, Northern Rhodesia, Tanganyika, Kenya, the Coryndon Museum (Nairobi) and private individuals.

SECTION IV.—GENERAL

(A) Diseases of Game

208. *Rinderpest*.—Acknowledgments are due to the Director of Veterinary Services for a résumé of the incidence of rinderpest with particular reference to game.

This disease was widespread in game and cattle in Karamoja, from where it spread to North Teso, and to a lesser extent to the Sebei plains north of Mount Elgon.

In North Teso game were not observed to be infected with rinderpest but buffalo, eland and warthog carcasses were found in Karamoja and on the Sebei plains and Elgon foothills, such discoveries being closely associated in place and time with outbreaks of rinderpest in cattle.

209. Outbreaks of rinderpest also occurred in a few isolated herds of cattle in the northern part of the West Nile District adjacent to the southern Sudan, the infection having been introduced from the Sudan through the medium of game but fortunately, spread of the disease southwards did not occur. No evidence, however, of infected game in this District was found.

210. For the past thirty years or more the rinderpest epizootics which have caused such havoc in Uganda have come from the north, and on the urgent representations of the Director of Veterinary Services as a result of this latest West Nile infection a scheme has been evolved in an endeavour to prevent future disease introductions from the north spreading southwards.

211. *Rinderpest Conference.*—In October, the Game Warden attended an International Rinderpest Conference which was held at Nairobi. One of the resolutions of this Conference recognised the urgency of creating a series of barriers to check the possibility of the southward spread of rinderpest originating in the north. It was agreed that the Uganda–Sudan border is of primary importance in this respect, and, in consequence, the Protectorate will endeavour to break the rinderpest link with the Sudan.

It will inevitably take several years to bring the necessary operations to a successful conclusion, but if in the end the success anticipated is achieved the saving in cattle losses and remedial expenses will be incalculable, and well worth the costs of the campaign, which should not be unduly heavy.

212. What it is proposed to do is to try and create a buffalo-free zone along the Uganda side of the border to a depth of twenty or thirty miles, as this very susceptible species is there abundant.

At present it is not considered necessary to try and free this area of all susceptible ungulates, as it is believed that the buffalo on account of its numbers and wandering habits is the animal almost entirely responsible for the spread of the disease, but time alone will show that this assumption is correct.

By the end of the year special anti-buffalo measures on a limited scale had commenced.

213. *Other Diseases.*—No other diseases of game came to notice during the year.

214. *Tsetse Control in connection with Game.*—The Kigezi resettlement (*vide* paragraph 198, 1947) continues to make good progress, and four game guards are still permanently employed in this area.

215. Tsetse control operations, which usually entail considerable interference with game, have continued in Ankole, Buruli, Bugerere, Lango, Acholi and eastern Karamoja. Particular attention was paid by the Department to the preservation of giraffe, black rhinoceros, the rare roan antelope and, to a certain extent, the Uganda kob.

216. Duly authorised organised tribal hunts have assisted considerably at the most favourable season in evicting game from the Acholi-Lango tsetse control area. It has been interesting to compare six months' results of tribal hunting with the achievements of the hunters shooting for tsetse control during the same period. Generally, with the exception of buffalo of which both methods show an almost identical bag, tribal hunting's greatest suceesses are with the smaller ungulates, and tsetse control with the larger, for instance the following figures:—

	Tribal hunting	Tsetse Control		Tribal hunting	Tsetse Control
Bush buck ...	611	73	Duiker	1,011	105
Bush pig ...	29	Nil	Oribi	894	363
Warthog ...	303	170	Reedbuck ...	427	100
Waterbuck ...	350	588	Kob	188	617
Hartebeest ...	345	1,247			

217. These figures somewhat strikingly bear out this Department's contention freely expressed in the past that straightforward tribal hunting with nets and spears is not unduly destructive to the larger antelopes.

218. In the latter part of the year two research workers from the East Africa High Commission Tsetse Reclamation Service were carrying out investigations in the Kibanda–Choepi region of eastern Bunyoro in connection with the carriage and spread, primarily by elephants, of the two tsetse flies *Glossina morsitans* and *G. pallidipes*.

(B) Economic Industries

219. *Crocodile Skins.*—Reference to the crocodile industry will be found in paragraphs 415–417.

220. *Game Skins.*—Considerable quantities of game skins, a result of the activities of tsetse control have been disposed of to the trade. In parts of the Eastern Province local traders are still permitted to purchase and sell the skins of the common duiker, an abundant and particularly destructive species.

(C) Notes of General Interest

221. *Murchison Falls Trip.*—During 1948 the Railway steamers carried 821 passengers to the Murchison Falls. The increasingly popular excursion to the Falls has this year been marred by a series of unfortunate incidents necessitating the killing of three truculent elephants, two buffaloes and a hippopotamus. In fact more wild animals have had to be killed in a few months than in the whole of the previous twenty years of this trip.

These incidents were carefully investigated and there is little doubt that in some cases animals were shot in order to enable visitors to get to the Falls. This was never intended, and the rule is that being a Game Reserve the visitors have to give way to the wild life, and if it is considered dangerous to proceed the walk to the Falls has to be abandoned.

222. The African game guards who constitute the protective unit accompanying the visitors have again been warned that their responsibility towards them does not include getting to the Falls at all costs. Further, as it was considered that the path in the vicinity of the anchorage was becoming overgrown to a dangerous extent arrangements were made with the Railway authorities to undertake the necessary clearing.

223. Complaints have been made by visitors who have seen wounded hippos in the river carrying in their bodies harpoon heads attached to large ambatch floats, which is the work of poachers.

On one occasion every effort was made to free an unfortunate hippopotamus of this instrument of torture, but without avail, and eventually all that could be done was to cut adrift the tell-tale float.

224. *Honorary Game Rangers.*—Honorary Game Rangers appointed during the year were Mr. L. St. C. Bartholomew, Mr. J. K. Marriott and Mr. C. S. Wilson.

225. *Game Conference.*—In June the Game Warden attended an informal Conference of East and Central African Game Wardens in Northern Rhodesia, at Chilanga (near Lusaka), which is the headquarters of the Game, Fisheries and Tsetse Control Department of that territory, at which the East Africa High Commission, Central African Council and Southern Rhodesia Game Department were also represented. The opportunity was taken of studying the progress made at Chilanga in fish culture, which though only in its initial stages has already achieved results of considerable importance.

226. *Scientific and Filming Expeditions.*—Amongst the numerous expeditions which are visiting East Africa in ever-increasing numbers and which included Uganda in their itinerary were a Swedish Natural Science Expedition; an Expedition from the University of California, including a United States Naval Medical Science Group, which was studying the role played by shrews in the transmission of malaria; the Gatti Expedition; a United States Mission, from the National Research Council of the Pacific Science Board, in quest of a parasite to destroy the large East African snail *Achatina* which has become an appalling pest since its introduction by the Japanese into the Pacific regions; the Elk-Combs (American) Expedition to film tribes and wild life; Mr. Arch Oboler who was accumulating material for a series of topical broadcasts in America; Mr. and Mrs. Rogers, to obtain documentary films and photographs of local interest; and Mr. Wilson of Glasgow, collecting wild animals for his private zoo.

227. *Collecting Wild Animals for Zoos.*—There have been several enquiries from zoos, but generally collecting for zoos is discouraged. As there are no wild animal dealers in Uganda itinerant expeditions trying to collect live animals are apt to foster an illegal and undesirable trade in protected species.

228. *Recalcitrant Bull.*—In November, the Department was called upon to deal with a recalcitrant bull at the Entebbe lake-shore slaughter house. The bull not unnaturally decided to live longer and proceeded to

see off anyone who tried to interfere with it. It refused to be caught and finally took refuge in the lake, where it was shot.

229. *Game Warden's Tours.*—The Game Warden was constantly on tour and visits were paid to all Administrative headquarters, with the exception of Arua, Moyo and Moroto. In addition, several visits were made to the Fisheries station at Kichwamba, as well as to Katwe, Kaianja lagoon, Lakes Edward and George, and the Kazinga Channel. Most of the fish landings along the Lake Victoria shore, including those at Jinja and Mjanji, were inspected more than once. A large number of dams in the Masaka, Teso and Lango Districts were investigated. Other places visited included Bundibugyo (in Bwamba), Butiaba, Masindi Port Mutunda and Atura Port, Lale and Bugondo (both on Lake Kyoga), Serere, Lake Salisbury and the Sebei region of Mt. Elgon.

230. *Increased Costs.*—The steadily increasing costs of all commodities and rising salaries are reflected in the progressively increasing cost of the Department year by year; in particular, rifles, ammunition and clothing are all much dearer.

SECTION V.—FISHERIES

(A) Administration

(1) GENERAL

231. A second Fisheries Officer who is eventually destined to take charge of Lake Albert arrived in August and spent the remainder of the year acquiring local knowledge in the Lakes Edward and George, and Kazinga Channel region.

232. As previously, the activities of the African fish guards continued to be concentrated on (*a*) the compilation of statistics, and (*b*) general control. The control staff has been further augmented by the appointment of additional fish guards, bringing the total to 36.

233. Once again during August, September, October and a part of November, the usual vigorous campaign has been prosecuted against the female crocodiles on the Lake Victoria breeding grounds. It is now a matter of routine that the arrangements for and the conduct of these operations are entirely in the hands of the African staff. This campaign always achieves good results.

(2) LEGISLATION

234. During 1948 the Fishing Rules, 1948, and various Legal Notices concerning the control of fishing were published by virtue of the Game Ordinance and the Trout Protection Ordinance.

The following is a list of the relevant Legal Notices:—

Legal Notices Nos. 40, 190, 252, 259 and 260.

The most important item is "The Fishing Rules, 1948", published in Legal Notice No. 252 which essentially amplify and strengthen "The Fishing Rules, 1947".

(3) NETS

235. *Supplies.*—A general shortage of all types of nets has continued. This is scarcely surprising as only 444 cwt. (1,142 ewt. in 1947) of fishing nets were imported, a decrease of 61 per cent. on last year.

236. **Table A.**

QUANTITIES AND VALUES OF FISHING NETS IMPORTED

Country of origin	Quantity	Value
	cwt.	£
United Kingdom	444	58,839

There were no importations from other countries.

237. It is understood that some headway has been made with the establishment of a flax-spinning and net-making factory on the Kenya side of Mt. Elgon.

238. *Prices.*—Net prices continue to soar. In 1947 the average price of imported nets per cwt. was £82, in 1948 it had risen to £132.

239. At the end of the year the retail price of the 5-inch net was Shs. 31/25 cents; of the 3-inch net Shs. 13/03 cents, and of the 2½-inch net Shs. 13/94 cents, representing increases respectively of Shs. 2/88 cents, Sh. 1/09 cents and Sh. 1/42 cents. The cotton seine net, or "gogo", advanced slightly from Shs. 150 to Shs. 152.

240. The net shortage naturally promotes a brisk black market which flourishes particularly in the Lake Edward region.

Large quantities of small mesh nets to meet requirements at Lake Kijanebalola are hand produced locally out of cotton thread.

A certain number of five-inch nets are home-made in the Sese Islands.

Table B.

(4) IMPORTS AND EXPORTS OF DRIED FISH

241. (i) Handled by Railway Steamers:—

(*a*) From Sese Islands and Kome:—

160 tons 707 lb. (of which all but 17 tons is from Sese), which is only about two-thirds of the tonnage handled last year. This drop is probably due to the islands' fishermen having made their own arrangements for transporting much of their dried fish to the mainland.

(*b*) From Tanganyika Territory:—

143 tons 528 lb. (of which all but 7 tons is from Bukoba), which is a drop of 37½ per cent.

Vide paragraph 224 (i) (*b*), 1947, it is probable that increasing quantities of fish are being conveyed overland from Bukoba.

No dried fish was imported by rail from Kenya.

(*c*) From Butiaba (Lake Albert) to the Belgian Congo:—

435 tons (approx.), which is an increase of 221½ tons, or more than double the 1947 figure.

(ii) Railed for Export from Mainland Ports and Railway Stations:—
76 tons 140 lb. which is 56 per cent. decrease on 1947.

242. Exported by Road:—

(*a*) To the Belgian Congo, through the Kisoro Customs Post—Nil.

(*b*) To the Belgian Congo, through the Vurra Customs Post—Nil.

(*c*) To the Belgian Congo, through the Mpondwe Customs Post.—Quantities and values of dried (salted) and smoked fish exported from Lake Edward and associated fisheries:—

243.

Month	Weight		Total	Value		Total
	Dried (salted)	Smoked		Dried (salted)	Smoked	
	tons	*tons*	*tons*	£	£	£
January ...	88	10	98	4,348	745	5,093
February ...	125	19	144	6,361	1,659	8,020
March	156	22	178	7,826	1,947	9,773
April	76	11	87	4,020	949	4,969
May	144	21	165	7,064	1,880	8,944
June	49	25	74	2,460	2,188	4,648
July	102	23	125	5,280	2,057	7,337
August ...	76	19	95	4,090	1,723	5,813
September ...	76	20	96	4,127	1,809	5,936
October ...	102	20	122	5,300	1,716	7,016
November ...	57	32	89	2,853	2,778	5,631
December ...	100	38	138	4,988	3,114	8,102
Grand Totals ...	1,151	260	1,411	58,717	22,565	81,282

244. In 1947, a total of 1,368 tons was exported which was valued at £58,084. The average price per ton of salted fish is £50 and of smoked £87: in 1947 it was £40 per ton for salted and £76 for smoked.

245. (iv) Imported into the Belgian Congo from Lake Albert *via* Mahagi Port:—

Month	Weight	Value
	Kilos	*Francs*
January	24,213	269,721
February	20,151	258,946
March	24,397	355,850
April	24,690	330,535
May	38,739	415,794
June...	26,981	269,810
July...	54,222	526,803
August	64,327	643,134
September	40,629	376,161
October	55,049	464,349
November	57,639	517,315
December	90,184	815,440
Total ...	521,221 (approx. 521 tons)	5,223,858 = £32,649 (calculated at the rate of eight francs to Sh. 1).

(B) Economic

(1) Lake Victoria

246. *Control.*—As usual the collection of data, the enforcement of the fishing regulations, co-operation with sleeping sickness control, and

the annual campaign against the breeding crocodiles, have constituted the principal activities of the Lake Victoria fish guards.

Once again the effort and the industry have been affected by the continued net shortage.

247. *Vide* paragraph 239, the price of nets has again risen, and the "Red Hand" five-inch mesh flax gill-net which cost Shs. 28/37 cents when 1947 closed, was at the end of 1948 selling at Shs. 31/25 cents.

In view of the progressively advaneing net prices—flax gill-nets are now two-and-a-half times pre-war costs—the fisherman is justified in demanding higher, but not unreasonable, prices for his catch, and naturally he will take advantage of a public which is prepared to pay unduly inflated prices.

248. There has been some falling off in the quality of the *ngege*, as the average weight is 1·49 lb., which compares unfavourably with the 1947 average of 1·56 lb.

249. *Breaches of Game Laws.*—Breaches of fishing regulations have not been numerous, those which have been detected being of a minor nature and principally coneerned with infringements of mesh size and fishing in prohibited waters—which is in fact an offenee against the Sleeping Sickness regulations.

250. *Lake Victoria Fisheries Board.*—Considerable progress has been made with the formation of the actual Lake Victoria Fisheries Service and in the middle of the year a Chief Fisheries Officer, who is also the Executive Officer of the Board, was appointed: his headquarters are at Mwanza. At the end of the year there arrived a second Fisheries Officer, who had been recruited and trained in the United Kingdom: for the time being he has been posted to Mwanza.

251. In December, a plenary meeting of the Lake Victoria Fisheries Board, which was attended by the Game Warden, was held at Mwanza. Much preliminary organisation, however, remains to be done, and serious investigations and development must await the arrival of suitable launches.

252. *Nakiyenje Basic Landing.*—Statistics were collected at Nakiyenje landing on the Entebbe peninsula on 291 (303 in 1947) days, during which period a total of 52,805 five-inch mesh gill-nets (approximately 181 per day) was set, being 11,421 more than last year, and approximating nearer to, though about 3,000 in excess of 1946 figures. 106,036 fish weighing 195,921 lb. (approximately 80 tons) were caught as compared with the 1947 figures respectively of 64,701 fish and 142,605 lb.

An average of two fish per net set was caught which is a marked improvement on last year's average of 1·5. The average weight of *ngege* works out at 1·47 lb. which is a slight decline on last year's figure of 1·5 lb. The increase in effort, notwithstanding the difficulty in obtaining adequate supplies of nets, is very welcome. The *ngege*—totalling 71,410—constitute 67 per cent. of the catch, and are more than twice the number landed in 1947. The daily equivalent is approximately 245 *ngege*.

253. The average weights of the principal species taken in the five-inch nets were:—

		In 1947
	lbs.	*lbs.*
Ngege*	1·47	(1·5)
Semutundu	3·2	(3·2 approx.)
Kasulubana	nearly 2	(2)
Kisinja	3·5	(3·35)
Male	5	(5·5)
Mamba	nearly 7	(7)
Mpongo	just over 1 lb.	(just over 1 lb.)

There is little difference in these average weights from the 1947 figures.

254. During 1948 no checks have been taken of the size of the *ngege* landed at Nakiyenje.

Small mesh nets were again in short supply, and only 625 were fished from this landing during a total of 29 days: in 1947, during 40 days 960 were used.

255. *Average weight of ngege.*—The average weight of this important economic species calculated from the statistics collected at the eight principal fish landings (excepting Nakiyenje) in Lake Victoria, from Jinja to the Sese Islands was 1·49 lb., e.g. just under 1½ lb. and is based on 351,078 *ngege*. This is an appreciable decline on last year's average of 1·56 lb. though slightly better than 1·46 lb. in 1946. The *ngege* catch at the eight principal landings shows an increase of 135,124 over the 1947 total. At Masese (Jinja) 123,035 *ngege* averaged 1·48 lb. approximately; and at the four principal Sese landings the average weights were respectively 1·46 lb., 1·47 lb. (approx.), 1·5 lb. and 1·5 lb.

256. *Average size of ngege.*—Several checks on the length of *ngege* were taken at various times of the year at Masese (Jinja), Mjanji, Katebo, Kaziru and Bukakata, and no undersized fish were found.

257. *Jinja Catches.*—The comparative Jinja (Masese) catches for 1947 and 1948 are as follow:—

Year	Days	Nets	Ngege	Semutundu	Kasulubana	Kisinja
1947 ...	273	34,819	123,090	10,044	11,144	2,005
1948 ...	248	31,934	123,035	11,909	4,031	1,129

The 1948 results based on 25 days less than in 1947 show a slight improvement in the *ngege* and an appreciable increase in the *semutundu* catch. The 1948 average catch per net set is 4·5 which is once again a fraction better than in the previous year. The average *ngege* catch is also better being 3·9 as compared with 3·5.

258. *Fishing Effort.*—In 1948, a total of 181,475 nets was set during a total of 1,856 fishing days at the fourteen principal landings, resulting in a total catch of 426,505 *ngege*.

In 1947, the respective figures were 111,133—1,418—291,904, which indicate a considerable increase in effort in 1948. The average number of nets fished per day is 98, a marked rise over last year when it was 78. The average number of *ngege* caught per net set is 2·3, which is a little lower (in 1947 it was 2·6).

259. *Kagera River.—Ningu* catches, with the 3-inch or $3\frac{1}{2}$-inch mesh gill-nets, at and in the vicinity of the mouth of the River Kagera are as follow:—

Landing	Days	Nets	Ningu	Weight
Masangano	75	4,133	39,254	35,852
Mubanzi	77	5,184	58,979	54,886
Igoma	65	7,025	52,431	51,310
Kyasa	59	6,384	49,615	48,077
TOTALS ...	276	22,726	200,279	190,125

The average weight of these *ningu* is approximately 0·95 lb.

260. In 1947, 40,028 nets set in a fishing period of 350 days caught 737,687 *ningu* which was the best for many years. The small catch in 1948 does not necessarily indicate a declining industry, and is directly related to a big reduction in the number of fishing days, as well as to almost half the number of nets, compared with 1947, being fished. The decline in effort is undoubtedly due to the difficulty in obtaining adequate supplies of small mesh nets. The average catch of nine *ningu* per net is still low.

261. *Dried Fish.*—Approximately 45 tons of dried fish were weighed by the fish guards at various landings. It was mainly *semutundu*, with a considerable proportion of *ngege* and *kasulubana*, and a goodly quantity of *ningu*. With the exception of $\frac{3}{4}$ ton from Kome and $\frac{3}{4}$ ton from Sese, it all came from Buvuma.

262. *Prices.*—Prices of fresh fish continue to rise, and so long as the price of nets continues to increase this is unavoidable.

The average wholesale prices at Nakiyenje were:—

	Shs. cts.	Increase in cents since 1947
Ngege.	0 75	5
Semutundu... ...	1 50	Nil
Kasulubana ...	0 40	20
Kisinja	1 30	50.
Male	1 50	60
Mamba	1 30	50
Mpongo	0 60	10

Some of these increases appear to be unduly high, and those ranging from 50 per cent. to as much as 75 per cent. are scarcely justifiable though evidently approved by the African members of the community who are ready to pay these inflated prices.

263. Nakiyenje prices for the smaller species were:—

	Cents	Increase in cents since 1947
Ningu	25	Nil
Nzere	20	(Previously 4 for 20 cents)
Nkeje ... 5 for ...	20	Nil
Nsoga ... 2 for ...	20	(Previously 3 for 20 cents)

264. *Value of the Lake Victoria Fishing Industry.*—A rough computation at the existing high prices suggests that the total value of the fishing industry in the Uganda waters of Lake Victoria is at least £65,000.

265. *Boat Building.*—Experimental boat building has made considerable progress at the Kampala Technical School where all the time essential improvements born of past experience are being incorporated in the latest models. By the end of the year five boats were under construction or test. The general plan is to produce a simple, comparatively inexpensive fishing craft so designed that construction shall be within the capabilities of African craftsmen working amongst their own people.

266. Although local interest in these experiments has increased and although much lip service has been paid to the efforts which are being made to evolve a suitable type of craft, the practical test comes when one of these vessels is put into the water and demonstrated. So far, unfortunately, the vessels demonstrated have proved a drug on the market; when it comes to the point no African wants them, unless they are fitted with mechanical propulsion. Sails are the subject of destructive criticism; it is true that most of the local fisherfolk are ignorant of the use of sails, but it is equally true that they do not want to try to learn how to use them.

267. The modified pattern Usembo Bay type of fishing boat which is being developed is a twenty foot, hard chine, carvel built, craft with square transom. One has been demonstrated at Kazi, on Murchison Bay, Lake Victoria, for several months, and another, in June, was taken to Katwe for demonstration on Lake Edward.

268. The last mentioned was used with sail and much to the amazement of the onlookers and critics travelled against the wind thus confounding the local critics who had declared that a sailing boat could only blow along with the prevailing breeze.

The possibilities of this craft were discussed in full detail with the local Chief and representatives of the Baganda Fishing Company, all of whom seemed keenly aware of its advantages. The business fraternity, however, wanted it to be powered with an outboard motor.

Although this boat, which had been purchased by the Native Administration, was received with some enthusiasm by the fishermen no attempt to use it was made once the European instructor had left, and at the end of the year it was lying derelict at Katwe.

269. Another vessel is of the same general design, but has a canoe stern, e.g. a double-ender, as opposed to the square transom type. This is similar in appearance to the traditional Sese fishing canoe, and it is believed that it may have greater appeal to the African fishermen. Shortly after the construction of this double-ender had commenced, a Sese canoe with a square transom was seen at Port Bell! The intention is also to try out these Usembo Bay pattern craft with outboard motors, and also with a fixed Diesel power unit.

270. An ex-pupil of the Technical School was returned to the School from Fort Portal for special instruction, and after having assisted in, and in one case supervised, the building of two boats, he was sent back

Although the Lake Albert Fisheries Officer arrived from the United Kingdom in early August, he was for various reasons posted to Kichwamba in the Lake Edward region until the end of the year.

278. *Vide* 263, 1947 Report, Uganda Lakes Ltd., which had been operating for about a year in Lake Albert and employing as its agents a trio of Cypriots, at the end of the year disposed of its interests to the newly formed Uganda Fish Marketing Corporation, who in its turn continued to employ this trio, styling themselves Kefreru, and with whom the necessary agreement was made.

279. Although difficult to assess with any degree of accuracy it is known that the Lake Albert fisheries are of considerable value and importance, and the export trade to the Congo is extensive. *Vide* paragraph 245, 521 tons of dried fish of Uganda origin, valued at £32,649, passed through the Belgian Customs Post at Mahagi, during the year. The total value of this industry may, however, be double this amount.

280. Cotton season prices are usually the best, during the period January to April, and prices paid at Mahagi for a 44 lb. bundle of dry salted fish in February, March and April were respectively Shs. 30, Shs. 33 and Shs. 30, though it was reported in March that a price of as much as Shs. 37 per bundle had been paid by some buyers. The average price paid per ton of dried salted fish was approximately £63.

281. The fisheries generally continue to flourish, and a reported scarcity of *mpoi*, a periodical complaint, may be due to adverse water conditions in the normal fishing grounds.

282. Early in the year during the dry season, when the region is most accessible the possibility was examined of establishing a fishing settlement on the Toro shore of Lake Albert. There had been several applications on the part of Africans who had never even visited the locality, for permission to fish there.

In the dry weather this locality is accessible by lorry, but for eight months of the year, except by water, it can only be reached on foot after a fifteen miles journey through water-logged country. Open water cannot be seen from the proposed site, and before the lake is reached one has to traverse tortuous channels through swamps infested with myriads of mosquitoes. Moreover, there is a lack of building materials and firewood. Good canoes, suitable for fishing in open waters, can be obtained from Kasenyi (Congo Belge) for Shs. 300 to Shs. 400 each.

Owing to its remoteness combined with numerous other disadvantages it has been decided, at least for the present, not to pursue this proposition.

283. A small fishery, however, is carried on profitably in this neighbourhood along the Semliki river, and owing to the shortage of locally produced food, high prices are obtained for smoked or fresh fish. *Ngege* are sold for 30 cents, *semutundu* for Sh. 1/50 cents, and other large fish may fetch as much as Shs. 6.

The stinking "fresh" fish trade between this region and Bwamba has to be smelt to be believed!

284. The West Nile fishing industry based on Panyamur, at the north western extremity of Lake Albert, continues to flourish. After the

Congo SHUN Company ceased to collect fish from this region by motor boat, the fisherfolk had perforce once again to take the dried commodity by dugout to Mahagi Port for disposal at the fortnightly market. In consequence the fishermen spent most of the money realised in the Congo instead of in Uganda.

285. At Mahagi Port there are at least ten independent buyers who buy several hundreds of tons of dried fish per annum, mainly from the Uganda Africans of Jonam and Bagungu. Normally, about Sh. 1 per kilo (or 45 cents per lb.) is paid for this dried (salted) fish, but during the period November to February prices usually rise to Sh. 1/50 cents per kilo (or 68 cents per lb.).

At Nioka (Congo) market inland the price is 16 francs per kilo (85 cents per lb.) and at Bunia 19 francs per kilo (Sh. 1 per lb.).

286. At the end of the year there was in process of formation in Madi a company—not then registered—to conduct large scale fishing operations in the Nile in order to supply Gulu with fresh and dried fish.

287. At Ndaiga at the south eastern end of Lake Albert in the Mubende District, four of the African inhabitants are conducting a small fishery to provide fish for local consumption. Various applications from non-natives and other immigrants to exploit the Ndaiga fishery have been refused.

(3) LAKE EDWARD AND ASSOCIATED FISHERIES

288. Fish guards are stationed permanently at Katwe, Katunguru and Kaianja for the purpose of collecting statistics and for control. A senior fish guard and another are allotted to the Fisheries Officer at Kichwamba, and, in addition, there are two more available for itinerant visits to Lake George. It has been found necessary to engage a fish guard especially to collect statistics on the Toro side of the Kazinga Channel, at Katunguru, owing to the magnitude of the catches now landed there.

289. Owing to exasperating delays on the part of the contractor the Fisheries Officer's house, which has a magnificent commanding site at Kichwamba overlooking the rift valley, was unfinished at the end of the year.

290. Control, despite the allocation of a launch for the sole use of the Fisheries Officer, has not been satisfactory in so far as Lake George is concerned, where organised poaching on an immense scale has developed.

Even large organised raids have had little effect except to put out of commission temporarily some of the illegal fishing camps. Poaching is much too profitable for any temporary action to act as an effective deterrent. The catches per net in Lake George are incredibly high; one canoe in a month can catch at least £100 worth of fish; and smoked fish sold to the Congo finds ready buyers at £90 per ton.

291. As usual, the major portion, amounting to 1,411 tons, of the catches from this well-stocked region has been exported dried (salted) and smoked to the Belgian Congo where there is still no slackening of demand and where once again rising prices are an incentive to increased

effort. Unfortunately a continued shortage of the necessary five-inch nets has interfered seriously with the effort and the export total to the Congo is only 43 tons more than in 1947.

292. TABLE OF CATCHES:—

Species	Katunguru		Katwe		Kaianja	
	No.	*lbs.*	*No.*	*lbs.*	*No.*	*lbs.*
Ngege	921,063	1,542,199	1,732,937	2,913,186	193,937	296,119
Semutundu ...	25,219	116,624	238,429	1,060,792	95	392
Kasulubana ...	347	1,263	661	2,137	...	...
Kisinja ...	11,819	29,140	53,567	153,742	13	43
Male	2,423	18,991	5,277	37,021	440	3,379
Mamba ...	7,279	59,541	9,779	90,080	1,335	10,806
Ningu	6	20	137	442	...	...
Total nets set ...	14,337 (and 62,242 hooks)		122,511 (and 54,610 hooks) (and 4,339 baskets)		... (and 917 hooks) (and 49,864 baskets)	
Total days fished...	356		362		362	

293. The total catch of the principal predatory species, e.g. *semutundu* (mainly), *male* and *mamba* was:—

Total number of predators	Total weight of predators	Total weight
	lbs.	*tons*
290,276	1,387,812	619·6

294. AVERAGES:—

	Katunguru	Katwe	Kaianja
Average number of nets per day ...	40	338·4	137·7 (baskets)
Average number of *ngege* landed per day	2,587	4,787	536
Average total weight of *ngege* landed per day	4,332 lbs. (nearly 2 tons)	8,047½ lbs. (a little over 3½ tons)	818 lbs. (a little over ⅓ ton)
Average *ngege* catch per net set ...	64·3	14·1	4 (per basket)

295. Average weight of:—

	Katunguru	Katwe	Kaianja
	lbs.	*lbs.*	*lbs.*
Ngege	1·67	1·68	1·51
Semutundu	4·6	4·45	4·1
Kasulubana	3·64	3·23	...
Kisinja	2·46	2·87	3·3
Male	7·8	7·2	7·7
Mamba	8·2	9·2	8·1
Ningu	3·3	3·1	...

296. The total tonnages caught at Katunguru and Katwe are:—

		At Kaianja
	tons	*tons*
Ngege	1,989	132·2
Semutundu ...	525·6	0·13
Kasulubana ...	1·5	...
Kisinja	81·6	...
Male	25	1·5
Mamba	67	4·8
TOTAL ...	2,689·7	138·63 (in baskets)

297. The total tonnage of the principal predators *semutundu* (mainly), *male* and *mamba* is:—

Katunguru and Katwe	Kaianja
tons	*tons*
613·5	6·1 (mainly *mamba*)

298. Comparing 1948 figures with those of 1947:—

(i) 53,238 more *ngege* were caught at Katunguru, an increase of 6 per cent. (total nets set show an increase of 16 per cent.); and 56,031 more at Katwe, an increase of 3 per cent. (net increase 46½ per cent.).

(ii) There has been a 33 per cent. increase in the numbers of predators caught, and a 50 per cent. increase in total weight.

(iii) The nets set per day at Katunguru show little change—40 in 1948 and 40·3 in 1947; at Katwe 63 more nets per day have been set indicating an increase of 23 per cent.

(iv) There has been a drop of just over 43 per cent. in the daily average of baskets set at Kaianja, but the average *ngege* catch per basket has again increased, from 2·27 to 4.

(v) The average catch of 64·3 *ngege* per net at Katunguru is 6·3 less, and the 14·1 at Katwe is a marked decrease on the 1947 figure of 20.

299.

(vi) Average weights of the various species show:—

(*a*) A slight increase in the *ngege* at Katunguru, from 1·64 in 1947 to 1·67; an increase at Katwe from 1·55 to 1·68; and an increase at Kaianja from 1·4 to 1·51.

(*b*) A rise in the *semutundu* both at Katunguru (from 4·45 to 4·6) and Katwe (3·85 to 4·45).

(*c*) A decrease in the *male* at Katunguru (from 8·5 to 7·8), and a slight increase at Katwe (from 7 to 7·2).

(*d*) A drop in the *mamba* at Katunguru (from 8·7 to 8·2); an appreciable rise at Katwe (from 8·36 to 9·2); and also an appreciable rise at Kaianja (from 7·3 to 8·1).

(*e*) A decline in the *kisinja* at Katunguru (from 2·55 to 2·46), and an increase at Katwe (from 2·68 to 2·87).

300.

(vii) The total nets set at Katunguru show an increase of 16 per cent. but there is not an equivalent increase in the total catch.

(viii) At Katwe there is a 46½ per cent. increase in the number of nets, but a very marked decrease in the extent of the catch.

(ix) At Kaianja there has been a tremendous drop in the number of baskets set, from 73,124 to 49,864—a difference of 23,260. This is due to the progressive drying up of the lagoon. Fortunately, this disaster has to a certain extent been off-set by an increased average *ngege* catch per basket set, from 2·27 to 4, and actually 27,712 more *ngege* were caught, but in a longer fishing period of 62 more days.

301.

(x) The total *kisinja* catch of 65,386 does not differ a great deal from the 1947 total of 68,514.

302. *Dried Fish.*—Owing to the ill-health of the Fish Culturist no systematic returns have been kept of dried (salted) or smoked fish sent from Katwe and Katunguru for Uganda's internal trade.

It is, however, known that Mr. Dina Nath of Katwe during the three months May, June and July exported to Kenya 70 tons of salted fish at a price at source of 85 cents per lb. (e.g. total value £6,664).

303. *Prices.*—At the end of the year Congo buyers were offering Sh. 1 per kilo for dried (salted) fish and Sh. 1/74 cents for smoked. As competition was keen, especially for the smoked commodity, there is a possibility that prices will rise even higher.

304. Although the *total catch* of each species (with the exception of *kisinja* and *ningu* at Katwe) as well as the *grand total of fish* taken in nets fished from Katunguru and Katwe show an actual increase, it must be appreciated that the recorded effort was 51 days greater at Katunguru, and 58 days greater at Katwe, than in 1947. Moreover, at Katwe there has been an increase of 23 per cent. (e.g., 63 nets) in the daily average number of nets fished.

305. Accordingly, these fisheries are not in the flourishing condition that the increase in extent of catches would at first indicate. The average catch of *ngege* per net fished from Katunguru has dropped from 70·6 in 1947 to 64 in 1948, and at Katwe from 20 to 14·1. The average catch of *fish* per net from Katunguru has dropped from about 73 to 67, and at Katwe from about 23 to 16.

306. The quality of the fish caught, and especially of the *ngege*, from the average weights recorded shows no cause for alarm, but in regard to the extent of the catch in relation to the effort there is a serious drop in results, particularly at Katwe, which seems to suggest that at least at Katwe the daily average of 338·4 nets fished is more than enough.

307. It is therefore time to restrict the number of nets which can be fished from any one vessel, otherwise permanent harm is likely to be caused to this important fishery with resultant progressively decreasing catches.

The one encouraging feature is the greatly increased number and weight of predators which have been caught.

308. (i) Investigations conducted in Katwe Bay have confirmed that *ngege* frequent the shallows, which constitute the greater part of this bay, for breeding. It is well known that this bay is consistently poached and it is almost certain that the serious reduction in the breeding females due to this habitual poaching is responsible to some extent for the decline in the average catch of the Katwe fishing fleet. In the deeper and more open waters of the bay there are plenty of *semutundu*.

(ii) The Fish Culturist noticed that there was a substantial increase in the *ngege* catches at Katunguru and Katwe during a period of heavy rains in February.

309. In August, the site of the prospective Kigezi fishing settlement at Rwensama was visited by the Game Warden, the Fish Culturist and the Lake Albert Fisheries Officer. The opportunity was also taken to investigate the mouths of the Ishasha and Ntungwe rivers, neither of which is readily detected from the lake. Near the mouth of the Ntungwe, where predators abound, limited fishing activities with baskets are permitted.

310. *Congo Industry.*—In the latter part of the year the Fish Culturist was privileged to visit the Belgian Government fishing industry at the south end of Lake Edward. He saw two remarkable hauls made by a seine net, 800 to 900 meters in length, near the Talia river which is about 10 miles distant from Vitshumbi.

(i) The first haul was when the net was laid around the mouth of the river and about 20,000 fish, mostly *barbus*, were caught. Hundreds escaped by jumping over the side of the net.

(ii) The second haul was at a point south of the river. The estimated catch exceeded 25,000 fish which were mostly *Tilapia nilotica*, practically all ripe fish, and nearly all females. 2 per cent. of the catch consisted of *Tilapia leucosticta*.

Only ten predator fish were seen. The entire surface of the water above the tightly packed bag at the end of the net as it was hauled in was swarming with tiny *tilapia*, in various stages of development, which had been ejected from their parents' mouths. They were being preyed upon by quantities of terns.

The report by the Fish Culturist, who is stationed at Kichwamba, follows:—

(4) Report by the Fish Culturist

311. Activities during the year have been concentrated on Lakes Edward and George and the Kazinga Channel, with a view to investigating the reasons why these comparatively small and restricted fishing areas are so consistently productive of a heavy yield of *Tilapia nilotica*, and whether the fishing effort could be extended to meet the demands of the local people of Toro, Ankole, and Kigezi, for a bigger share in the natural wealth of their lakes.

312. *Fertilisation.*—The waters of Lake George and the Kazinga Channel receive a generous application of organic and liquid fertiliser from the hundreds of hippopotamuses. Plant nutrients are being constantly added to the water and surrounding shores through the medium of

308. (i) Investigations conducted in Katwe Bay have confirmed that *ngege* frequent the shallows, which constitute the greater part of this bay, for breeding. It is well known that this bay is consistently poached and it is almost certain that the serious reduction in the breeding females due to this habitual poaching is responsible to some extent for the decline in the average catch of the Katwe fishing fleet. In the deeper and more open waters of the bay there are plenty of *semutundu*.

(ii) The Fish Culturist noticed that there was a substantial increase in the *ngege* catches at Katunguru and Katwe during a period of heavy rains in February.

309. In August, the site of the prospective Kigezi fishing settlement at Rwensama was visited by the Game Warden, the Fish Culturist and the Lake Albert Fisheries Officer. The opportunity was also taken to investigate the mouths of the Ishasha and Ntungwe rivers, neither of which is readily detected from the lake. Near the mouth of the Ntungwe, where predators abound, limited fishing activities with baskets are permitted.

310. *Congo Industry.*—In the latter part of the year the Fish Culturist was privileged to visit the Belgian Government fishing industry at the south end of Lake Edward. He saw two remarkable hauls made by a seine net, 800 to 900 meters in length, near the Talia river which is about 10 miles distant from Vitshumbi.

(i) The first haul was when the net was laid around the mouth of the river and about 20,000 fish, mostly *barbus*, were caught. Hundreds escaped by jumping over the side of the net.

(ii) The second haul was at a point south of the river. The estimated catch exceeded 25,000 fish which were mostly *Tilapia nilotica*, practically all ripe fish, and nearly all females. 2 per cent. of the catch consisted of *Tilapia leucosticta*.

Only ten predator fish were seen. The entire surface of the water above the tightly packed bag at the end of the net as it was hauled in was swarming with tiny *tilapia*, in various stages of development, which had been ejected from their parents' mouths. They were being preyed upon by quantities of terns.

The report by the Fish Culturist, who is stationed at Kichwamba, follows:—

(4) Report by the Fish Culturist

311. Activities during the year have been concentrated on Lakes Edward and George and the Kazinga Channel, with a view to investigating the reasons why these comparatively small and restricted fishing areas are so consistently productive of a heavy yield of *Tilapia nilotica*, and whether the fishing effort could be extended to meet the demands of the local people of Toro, Ankole, and Kigezi, for a bigger share in the natural wealth of their lakes.

312. *Fertilisation.*—The waters of Lake George and the Kazinga Channel receive a generous application of organic and liquid fertiliser from the hundreds of hippopotamuses. Plant nutrients are being constantly added to the water and surrounding shores through the medium of

hippopotamus manure. The curious habit of this animal in scattering its dung with its tail ensures this fertiliser being applied in a most useful manner. Not only is it broken down into small particles thereby considerably reducing the time taken for its decomposition into useful salts, but the amount of oxygen required in this process is also considerably reduced. In other ways the hippopotamus is also of benefit to the fishery. Its movements through the water stir up the bottom muds thereby materially assisting in the liberation of nutrients into the water. Also, it keeps down underwater rooted vegetation, and to some extent prevents the fishermen from fishing their nets too close to the shore where *tilapia* are known to go for or after breeding.

313. *Lake Edward.*—The shallow water fringing the Uganda shores of Lake Edward is also the home of numerous hippopotamuses. While receiving an abundant application of fertiliser from these animals the turbulent conditions caused by waves in the more open and larger expanse of water is unsuitable to the successful propagation of the free swimming phytoplankton found in Lake George and the Kazinga Channel. Their place is taken by filamentous algae which are able to attach themselves firmly to rocks and underwater vegetation. These growths with their attendant zooplankton largely comprise the food consumed by the *tilapia* in this lake.

The protection of the hippopotamus is essential to a continued heavy yield of fish.

314. *Parasites.—Tilapia* and *bagrus* from Lakes Edward and George are singularly free from nematode worms and other parasites, common in fish from other lakes. The cichlids (which form the principal food of *bagrus*) are clean feeding owing to the abundance of phytoplankton towards the surface. They do not, therefore, have to grub about amongst rooted aquatic vegetation and bottom muds in search of food, and thus avoid contact with parasitic worms or their larvae. These parasites, however, are probably in reduced numbers in these waters owing to the abundant organic fertilisation. That nematodes are present in these lakes is shown by their invariably being found in the stomachs of pelicans when shot, and also in *clarias*. This fish is a bottom feeder and at night can be seen or heard grubbing about in the mud and rooted vegetation in the very shallow water near the shore, in search of snails, frogs, worms, etc.

315. *Pelicans.*—Of the two species of pelicans found in these lakes the shooting and examination of several dozen birds have shown that while they both live on fish, the rosy pelican feeds more frequently on *tilapia*, which it consumes in enormous quantities. The pink-backed pelican (*Pelecanus rufescens*) which is in lesser numbers, feeds close to the shore and to a large extent on *Haplochromis*. Some species of *Haplochromis* being predators prey on juvenile *tilapia*. *P. rufescens* (together with *Anhinga rufa* the darter) is therefore of more benefit than harm to the *tilapia* fishery, and although no doubt *tilapia* are occasionally eaten, an examination of the mass of fish bones beneath a nesting colony of *P. rufescens* revealed no large *tilapia* bones. The large rosy pelican (*Pelecanus roseus*) on the other hand, especially when shot in Lake George,

has invariably contained *tilapia* or the remains of *tilapia*. It has not been possible to assess the exact weight of fish consumed by a rosy pelican each day but 6–8 lb. of *tilapia* taken from birds shot while still fishing suggests 10 lb. is not an over-estimation. As the rosy pelican population of these lakes is more than a thousand the total weight of fish consumed in a year is considerable.

316. *Aquarium Experiments.*—Four *Tilapia nilotica* were kept in a small aquarium with a view to investigating this species' breeding habits. On the bottom of the tank six inches depth of sand was laid, and *Sagittaria* and other rooted underwater vegetation planted as an aid to aeration. When these had taken root the fish were introduced. They were fed regularly on the larvae of chironomid flies, but within a few days of their introduction the fish had torn up and eaten all the vegetation. Water lettuce (*Pistia*) was then put on the surface where it quickly spread and was apparently distasteful to the fish as they did not eat it. After being in the tank for about a fortnight the male commenced to build a nest. It hollowed out a saucer shaped depression by creating a current with a quick downward and sideways sweep of its tail. When apparently tiring of this it would stop over the depression using its pectoral fins vigorously so as to create a current which also moved the sand. These operations were continued until a hollow was formed in which the fish could lie with most of its body below the rim. It then commenced chasing the females about and biting at their sides and driving them towards the nest. None of these could have been ripe as they did not breed and unfortunately all died before they could do so. The colour of the male during the building, and especially after completing the nest, was very bright.

317. That *Tilapia nilotica* do not tolerate the presence of other fish, and at times are even cannibalistic, was shown when fifteen small *Haplochromis* of about half an inch in length were introduced into the aquarium. Not only were these small fish attacked but several were eaten immediately and the rest finished off during the night. When this experiment took place the *nilotica* had not been fed for several days.

318. *Breeding of Tilapia nilotica.*—Along the sandy shores of Lake Edward the catches of *Tilapia nilotica* have consistently shown a preponderance of males to females of approximately two to one. In the waters of Lake George, the Kazinga Channel, and the bays in Lake Edward, more females to males are taken in about the same proportion. In a single haul of a 900 meter seine net, seen in the Congo, and near the mouth of one of the rivers entering Lake Edward, an estimated 25,000 *tilapia*, all but 2 per cent. being *nilotica*, in every stage of breeding were taken. The other 2 per cent. were *Tilapia leucosticta*. In this remarkable catch females predominated in a ratio of approximately twenty to every male. The particular place was off a sandy beach, in clear water, and away from papyrus swamps. Ripe males have been taken in Lake George especially towards the clearer water along the northern shore and where rivers enter this lake. Some ripe males are invariably seen with the daily catch from the Kazinga Channel. From these observations it is noted that although breeding is not confined to any particular places, conditions

most favoured for breeding are a well aerated water, with a sandy bottom, particularly near the mouths of rivers. It is near such places that large numbers of rosy pelicans are usually seen fishing. In every instance when a pelican has been shot while fishing in such a locality the fish taken from it have been breeding females, some having been swallowed with the young still carried in their mouths.

319. *Salted Fish.*—While the preparation of salted fish still leaves room for improvement, advice to the fishermen at Katwe and Katunguru, and the higher prices obtained for a well-cured product, have resulted in the better preparation of the fish by the exclusive use of salt imported from Aden. With the exception of 70 tons sold to Kenya by Messrs. Dina Nath of Katwe, the bulk of salted fish amounting to 1,150 tons went to the Congo. Prices remained around Sh. 1 per kilo. throughout the year.

320. *Fresh Fish.*—Katwe Fisheries, Ltd., started operations during the year with the object of supplying the Kampala market with fresh fish from Lake Edward. Several consignments, with the fish packed in ice and sawdust, were tried, but the increased price of the fish at source, and the high cost of transport, as well as losses from deterioration in transit proved too costly.

321. Ten cyclists are engaged in purchasing fresh fish at Katunguru and selling them at a profit of 5–10 cts. on each fish to the people of Bunyaraguru. The fish are sold at Lugazi market or to buyers along the road. Between 250 and 300 fish are sold by these traders every day.

322. The bulk of the fish caught at Kaianja Lagoon is sold fresh to the Bakonjo cultivators from near Bwera and Kanyampara. The price of *tilapia* at Kaianja has increased from 10 cts. to 20 cts. Many of the fish are bartered for muhogo flour and other food.

323. *Smoked Fish.*—An increased demand for smoked fish created by Greek buyers from the Congo has brought about an increase of curing by this method. Fishermen estimate that whereas the cost of preparing one ton of smoked fish requires a ton of wood costing Shs. 37, it costs approximately the same amount in imported Aden salt to cure 300 fish by salting. The prices obtained for smoked fish have varied from Sh. 1/50 to Sh. 1/90 with most being sold at Sh. 1/80 per kilo. The smoked fish is very brittle and therefore cannot be packed in the same manner as salted fish. When sold to the Congo the fish are packed in special wicker baskets which are brought over by the fish buyers. Fish cured by smoking, although it does not keep as well as salted fish and is liable to attack by insect pests and rats, is preferred by the African, especially in Uganda. In the closed waters of Lake George smoking is the method employed by poachers for curing their illegally caught fish. This method of preparation is quick and only requires the digging of a pit, the laying of the fish between a framework of papyrus, and smoking with materials readily available in the thickly forested area.

324. *Poaching.*—The high prices and demand for smoked fish has led to increased and organised poaching in the closed area of Lake George. The capture of poachers, nets, boats and fish, and in some cases heavy sentences, has not deterred these poachers, many of whom are bad

characters willing to take the risks of capture, which are small, in a gamble which, when it comes off, can easily amount to as much as Shs. 2,000 in one month's fishing.

325. *Fishing from the Ankole shore of Lake Edward.*—It has not yet been possible to construct a road to the proposed new fishing village near Kazinga.

326. *Kigezi shore.*—The opening up of fishing on Lake Edward to the inhabitants of Kigezi awaits the construction of a track to the settlement site.

327. *Lake Katinda.*—This small crater lake, containing five hippopotamuses, has been fished daily by one man using two nets. It continues to produce a good quality fish in numbers sufficient to meet the requirements of the Kichwamba Hotel and many local Africans.

328. *Lake Mulambi.*—This small crater lake adjoining Lake Katinda contains no hippopotamuses. A few *Tilapia nilotica* can still be taken with a 5-inch net, but they are too few to be profitable.

329. *Lakes Chuwera and Kyamwiga.*—These two little lakes have been examined. They contain a fair number of hippopotamuses and a good sized *tilapia*. The names of six local fishermen have been sent to the District Commissioner, Ankole, for the necessary permission to fish in these lakes.

330. *Other Lakes.*—Some waters which owing to their depth or having no means of outside fertilisation (such as by hippopotamuses) show for their expanse of water a poor return in fish. Such waters as Bunyonyi, Saka, Nkugute and many of the crater lakes and dams are examples. Some have been stocked with *Tilapia nilotica* but these fish, in the absence of phytoplankton and seeking food in other directions, develop a "muddy" flavour and become infested with parasites.

331. A number of these lakes contain an invertebrate fauna more suitable as food for an omnivorous species of *tilapia*. The majority of the lakes are in areas visited by tourists, and the introduction of a predator having an angling value would prove an added attraction to such visitors.

332. *Fish Farming.*—It has not been possible to commence fish farming experiments with indigenous species.

333. *Lake Nakavali.*—The following shows the *Tilapia nilotica* catches in Lake Nakavali during 1948. During the year the number of fishing permits was increased from four to fifteen.

January	...	No nets. These had been destroyed by crocodiles.
February	...	1,954
March	...	1,449
April ...	...	2,335
May ...	...	4,580
June ...	...	7,174
July ...	...	8,021
August	...	5,051
September	...	4,432
October	...	7,738
November	...	4,165
December	...	2,305
TOTAL	...	49,204

These figures are as received from the fishermen. The fish position in Mbarara during the year has much improved. Last year there were constant reports of nets being destroyed by crocodiles.

334. *Crocodiles in Lake Nakavali.*—30–40 crocodiles were destroyed, by shooting, in Lake Nakavali. This was done at night from dugout canoes with the aid of a spotlight and a six volt car battery. This is a successful method as the animal can be approached to within pointblank range.

335. When shot in the brain a crocodile generally turns over on its side, or back, with its feet out stiff, and it remains like this for a little while, often long enough for a rope to be tied to it, so that it can be dragged ashore. It sometimes happens that a crocodile when hit will cause a disturbance on the surface of the water and attract others to it. On one such occasion three more crocodiles put in an appearance and moved towards the wounded one. Two of the newcomers were shot and the wounded one was then finished off.

336. On another occasion the spotlight showed several pairs of crocodiles' eyes quite close to the shore and at a place from which curious "gulping" noises were coming. On investigating, the noises were traced to a large shoal of *clarias*. These were hunting as a pack and numerous frogs could be seen jumping out of the papyrus into the deeper water where other *clarias* were waiting for them. None of the fish was being eaten by the crocodiles which may have been dazzled by the light. One crocodile was shot but not landed so it could not be ascertained to what extent it had been feeding on the *clarias*.

337. Examination of the stomachs of crocodiles shot at Nakavali at night invariably showed signs of some food, mainly fish in stages of being digested, while one contained a young darter and the bones and feathers of others. The shooting of this particular crocodile occurred under a tree in which large numbers of darters were nesting. It had evidently found this nesting place an easy source of food supply, as the young darter is a clumsy bird and quite frequently when it has reached the nest-leaving stage and takes fright it falls or dives into the water.

338. Food is usually absent from the stomach of a crocodile shot during the daytime. This is due to the animal feeding mainly at night and to its rapidity of digestion. It is amongst the thick growth of rooted underwater vegetation in which numerous *tilapia* can also be seen that numbers of crocodiles (except at the breeding season) are found on Lake Nakavali. All the crocodiles shot in such areas at night contained *tilapia* or *tilapia* remains when examined, and in this lake they feed mainly on fish.

339. They have become so used to robbing nets that one evening a canoe which left one of the landings was shortly afterwards followed by two crocodiles which took off from different places along the shore. Old nets were purposely sent out on this occasion and the two crocodiles were later shot while they waited hopefully near them. The fishermen had reported that these particular creatures, both specimens over twelve feet in length, had become exceedingly bold and had to be kept away by constantly beating the water when the nets were fished during the day.

340. The largest crocodile shot at Nakavali during the year measured over 16 feet. This huge specimen after having been fired at and missed became very wary. Eventually, he was shot one night when raiding set-nets. He was seen to surface only a few yards away covered with fishing net which had several *tilapia* still in it and flapping about on his neck and back. At the shot he disappeared but was so entangled in the nets that it was possible to drag him ashore with them. He was an old male and his stomach contained about thirty *tilapia* and bits of net. Four of the nets which had been set were completely destroyed and the others badly damaged.

341. *Crocodile near Lake George.*—During the year a species of forest riverine crocodile *Osteolaemus tetraspis* hitherto recorded from West Africa and the Congo, was found in a prospecting pit (into which it had fallen) near the Hoindagi river. The place is about five miles from Lake George. This rare specimen appears to be very old and is almost black in colour on the back and undersides. It measures 5 feet 10 inches in length. No anxiety is felt for the fisheries by the finding of this crocodile in the area as it is a species which is only found in rivers bordered by thick forest. No crocodiles have been seen or reported from the lakes themselves.

342. *Co-operative Groups of Fishermen.*—Three additional net fishing licences were issued during the year to the Toro fishermen at Katunguru. Each licence was issued to a group of ten men jointly owning one vessel. This was done with a view to encouraging the men to acquire, if possible, a sense of responsibility by sharing in the work and profits of their trade. The remaining 17 available licences for Lake Edward have been reserved for issue to similar groups at Katwe. The numerous applications for net fishing licences do not justify the issue of a licence to an individual when such licences are limited, as the individual owner can without doing any fishing himself, obtain up to Shs. 100 per month by hiring out his vessel to less fortunate fishermen.

343. *Longline Fishery.*—It has not yet been possible to increase the number of vessels for long line fishing in the Lake Edward/George area. Those fishermen already engaged in this type of fishing are making increasing use of *haplochromis* as bait. These small fish are caught near the landings on barbless hooks baited with offal.

T. C. VAN INGEN,
Fish Culturist.

30TH APRIL, 1949.

(5) LAKE KYOGA

344. The following table gives the catches as checked by the fish guards in the Labori region of Lake Kyoga:—

	Landing											
	Kasiyi (Labori)		Namutinda (Labori)		Kapundo (Labori)		Mugalama (Labori)		Nakasiriki (Labori)		Kabwoso (Labori)	
Days	131		151		81		23		13		35	
Hooks	3,364		3,144		5,080		1,800		844		790	
Baskets	3,984		3,635		1,094		137		60		480	
	No.	*lbs.*	*No.*	*lbs.*	*No.*	*lbs.*	*No.*	*lbs.*	*No.*	*lbs.*	*No.*	*lbs.*
Nandere	228,850	63,921	244,049	70,766	64,423	22,702	8,854	2,813	1,483	700	21,270	7,252
Semutundu	27	101	52	220	17	77	7	25	...	...	14	85
Kasulubana	6	7	5	5	...	...	...	...	...	...	3	2
Kisinja	96	116	205	288	14	36	8	16	...	...	9	17
Male	265	692½	185	546	354	1,222	138	451	5	19	115	319
Mamba	297	1,980	278	2,219	228	1,362	96	476	70	419	125	592
Ningu	241	115	205	71	313	110	29	10	10	5	95	33
Nkeje	...	...	26	5	14	4	...	...	25	8	...	...
Nzere	41	14	120	30½	6	2	...	...	...	...	17	9
TOTAL ...	229,823	66,946½	245,123	74,150½	65,369	25,515	9,134	3,791	1,593	1,151	21,648	8,309

345. The fall in effort continues and compared with 1947 an average of only 21·6 baskets a day were set over a total recorded period of 434 fishing days (422 in 1947), but the *nandere* catch has greatly increased from 185,852 to 568,929.

The average weight of 568,929 *nandere* is 0·3 lb. which is a big drop on the 1947 average of 0·39 lb. The total weight of *nandere* is 75 tons.

Control measures have been the same as in previous years.

(6) Minor Lakes and the Victoria Nile

346. *Lake Kijanebalola.*—The acute shortage of small mesh nets has continued to affect very adversely what was last year an extremely profitable and thriving industry. The majority of nets are home-made and last on an average 45 days. Two nets, each of a length of fifty yards, and with three-inch mesh, can be made locally from a packet of thread costing Shs. 25 or Shs. 26. This compares very favourably with the Shs. 16 charged for an imported three-inch net. At one time it was reported that some imported nets had been retailed for as low a price as Shs. 13/50 cents, but it was never ascertained exactly what they were.

347. The "Koki" boats, made mainly of *musizi* wood vary in price according to size and transport charges. The cost of the larger size is Shs. 80 and of the smaller Shs. 65 to which has to be added transport costs varying from Shs. 20 to Shs. 25, but it is said that some of the boats delivered at the lake have cost as much as Shs. 120. On the other hand one enterprising artisan has set up building this type of craft on the lake shore at Shs. 50 apiece.

For dugouts, which are fashioned principally out of the bark cloth tree there is a wide range of prices from Shs. 15 to Shs. 65, but they do not last long.

348. There is no evidence to indicate that this lake is being over fished, although in March the local Saza Chief, the Kamuswaga, stopped fishing on the grounds, amongst others, that the driving of fish was unduly reducing the stock. He also forbade fishing by "foreigners", which referred to all Africans who were not Bakoki. The use on a small scale of the 2½ inch mesh net is neither in the best interests of the fishermen nor of the fishery.

In May, fishing was being conducted from eight landings, but throughout the year the effort was greatly impeded by the net shortage.

349. The prices generally prevailing have been Sh. 1 for 45 fresh, or for 30 smoked, *ngege*. At certain landings the price was Sh. 1 for 40 fresh fish. The barter value of a normal size bunch of bananas was 35 *ngege*. Shs. 16 was the price of a bundle of 500 smoked *ngege*. A large quantity of fish is bartered for food. Local middlemen purchase 80 *ngege* for Shs. 2 to retail at a considerable profit; this is a cycle service.

350. In March a "Distribution of Fish" licence was granted Uganda Lakes Ltd., for the four months till the end of June, which was subsequently extended till the end of the year. This stipulated that this Company was restricted to the export of not more than three tons of dried fish per week, but it did ensure an organised market for much of the fishermen's catch.

351. As the hippopotamus is a most valuable contributor to satisfactory plankton growth in shallow, still waters (*vide* paragraphs 124 and 312), it is essential that this big, aquatic beast is protected as much as possible in this lake.

352. On account of the relative importance of this fishery two fish guards have been posted to this region for most of the year to collect statistics.

Lake Kijanebalola—Masaka—Small Mesh Nets

353. Some figures of fish catches and dried fish are tabulated.

Landing	Days	Nets	Hooks	Baskets	Ngege		Male		Total	
					No.	*lbs.*	*No.*	*lbs.*	*No.*	*lbs.*
Kiwololo	115	7,761	...	37	343,524	125,434	310	1,062	343,834	126,496
Kyettaka	15	155	...	...	11,044	3,720	1	2	11,045	3,722
Luzinga	38	868	...	124	47,194	15,176	225	865	47,419	16,041
Byembogo	8	58	...	...	1,914	669	1	3	1,915	672
Kasenyi	17	295	...	14	10,410	3,608	518	1,028	10,928	4,636
Lukolombwa	65	2,530	228	...	135,950	50,849	62	148	136,012	50,997
Ichumunankoni	16	242	...	...	12,768	4,069	1	2	12,769	4,071
Malemba	36	1,894	...	...	73,902	24,503	165	203	74,067	24,706
Rwenchwera	8	370	50	...	18,977	5,873	5	20	18,982	5,893
Kabakyala	6	72	...	...	3,358	1,206	...	...	3,358	1,206
Bale	6	62	...	...	4,575	1,725	...	...	4,575	1,725
Kayiringito	5	46	...	...	1,100	343	...	...	1,100	343
Kawala	10	30	...	...	1,890	646	2	6	1,892	652

354. Lake Kijanebalola—Dried Fish

Landing	Days	Ngege		Total	
		No.	*lbs.*	*No.*	*lbs.*
Lukolombwa	4	19,807	1,817	19,807	1,817
Luzinga	4	30,607	2,277	30,607	2,277
Rwenchwera	3	23,868	1,643	23,868	1,643

355. *Lake Kachira.*—There is little to record from this lake except that a small fishing industry continues to be conducted. In the absence of effective control there is a tendency to over-fishing, which brings the fishermen into conflict with the resident hippopotamuses, as they set their nets farther and farther afield. But the hippopotamus plays a most important part in the economy of all shallow inland waters where there is a fishing industry, and the eradication of this large, useful creature would be disastrous. Fishing with small mesh nets of a size less than five inches, which is illegal, unfortunately continues.

356. *Lake Nakavali* (*Ankole*).—Further reference to this well-stocked little lake is made in the Fish Culturist's report (paragraphs 333–340). Twenty-four five-inch nets appears to be the maximum number of nets which can be safely fished without unduly redueing the stock of that fine *ngege Tilapia nilotica.*

Four prospective fishermen were sent to Katunguru for instruction in the use of the five-inch mesh gill-net.

357. Owing to the continued prevalence of crocodiles, notwithstanding the control measures that are constantly being taken against these destructive and dangerous pests fishing by night is impossible owing to the certainty of net destruction—one crocodile can in one night irreparably wreck a whole fleet of nets. The cost of an *ngege* at the lake side is 20 cents, but by the time it has arrived at Mbarara, some 20 miles distant, thc price has risen to 35 cents; this means that the middleman carrying 100 fish to this centre can earn Shs. 15 per day.

358. *Lake Mburu and Lake Mikera.*—In January there were further transfers of *T. nilotica* to these two South Ankole lakes, which are already known to contain small numbers of this *ngege*, in order to accelerate stocking, as well as in the hope that fish from these waters will find their way into nearby Lakes Kasasa and Kavandete.

359. *Lake Kaletwa* (*Ankole*).—This little lake which has been naturally stocked by eseapes from Lake Nakavali contains some large *Tilapia nilotica.*

360. *Lake Bunyonyi* (*Kigezi*).—There is little of particular interest to report about the local *ngege* fishery.

361. *Lake Mutanda* (*Kigezi*).—The local *ngege* fishery has developed into a flourishing minor industry, but constant complaints by African agriculturists of the damage caused to crops by hippopotamuses constitutes a scrious threat to this fishery. The parts of this lake in which the *ngege* really thrives and is abundant are those at the northern and southern end frequented by this large amphibious beast. The hippopotamus is of vital importance to the welfare of this fishery, which is far superior to that of Lake Bunyonyi. Should the hippopotamus disappear from Lake Mutanda the economic fishery will certainly suffer.

362. *Lake Nabugabo* (*Masaka*).—Beyond the fact that this fishery continues on the usual primitive lines there is nothing to report. There must be some profit in it or it would have ceased long ago.

363. *Lake Kaianja* (*Masaka*).—A little basket fishing takes place in this small lake, but there are certain inhibitions about fishing on the

part of the local resident population. It is still not known (*vide* paragraph 331, 1947) whether any of the *Tilapia esculenta* introductions have survived.

364. *Lake Niungu* (*Ankole*).—This small crater lake, which is about two miles south of the Kichwamba Hotel contains plenty of *Tilapia trewavasae*, as well as stunted *T. nilotica*. It is fished by some dozen Africans with rod and line and single home-made hook, using larvae of chironomid flies as bait. Each angler catches 10 to 12 fish per day, either for his own consumption or to retail at 5 to 10 cents each. They fish from small rafts made of banana stems. The Fish Culturist using fine tackle and the same bait caught eight of these fish in half-an-hour; two fish were also taken on a fly.

365. *Lake Saka* (*Toro*).—This crater lake seems to be overstocked with stunted *Tilapia nilotica*. Possibly owing to a lack of its normal plankton food many of these fish have a minute black parasite embedded in the tissue immediately beneath the scales.

366. *Lake Isunga* (*Toro*).—This small crater lake is overstocked with stunted *Tilapia nilotica*, and *Tilapia trewavasae* also occurs.

367. *Lake Kiyanja* (*Masindi*).—This small, shallow lake, not far from Masindi, is about 250 acres in extent and fringed with papyrus. *Tilapia esculenta* from the King's Lake, Kampala, were introduced in February, 1946. In May, 1948, a small party of Europeans fishing with worms caught 125 of these *tilapia*, averaging about 1 lb. each, in $2\frac{1}{4}$ hours one evening. Since then fishing has been poor and eight in an evening is the best performance of one rod. Also, fishing before the great day had resulted in extremely meagre catches of *tilapia* and a few *clarias*.

368. *Masindi Water Supply*.—There are plenty of *Tilapia esculenta* in this small dam, as a result of the 1945 introduction.

369. *Victoria Nile* (*Buruli*, *Buganda*).—The fisheries in the Victoria Nile based on Lwampanga, Kitobwa and Muyinami were investigated respectively on 170, 174 and 13 days. These fisheries are conducted with hooks and baskets. The appended Table gives details of the catches.

The average weight of the *nandere* is 0·4 lb. (0·42 lb. in 1947); and of the three predators—*semutundu* 6·3 lb., *male* 4·5 lb., and *mamba* 9·6 lb. The *kisinja* average 3·5 lb.

370. VICTORIA NILE—BURULI—BUGANDA

	Landing					
	Lwampanga		Kitobwa		Muyinami	
Days	170		174		13	
Hooks	75,138		47,156		...	
Baskets... ...	2,316		3,932		4,241	
	No.	*lbs.*	*No.*	*lbs.*	*No.*	*lbs.*
Nandere ...	24,341	9,739	3,583	1,347	...	...
Semutundu ...	2,716	17,167	1,549	9,599	5	37
Kasulubana ...	374	290	7	12	...	...
Kisinja ...	267	916	133	469	8	35
Male	1,212	5,446	654	3,085	2	10
Mamba ...	1,451	15,306	4,008	37,026	...	...
TOTAL ...	30,361	48,864	9,934	51,538	...	...

371. *Victoria Nile* (*Buruli*)—*Dried Fish.*—Dried fish landed at Lwampanga for transmission to Kampala was weighed as follows:—

QUANTITIES OF DRIED FISH EXPORTED FROM VICTORIA NILE AND LAKE KYOGA TO BUGANDA

Month	Species							
	Nandere		Semutundu		Male		Mamba	
	No.	*lbs.*	*No.*	*lbs.*	*No.*	*lbs.*	*No.*	*lbs.*
March and April ...	3,996	337	895	2,354	56	140	4,072	10,326
May and June ...	17,724	2,374	848	1,766	149	209	2,672	8,349
July and August ...	2,370	403	258	836	...	...	475	1,246
November and December ...	3,976	482	405	651	47	140	620	1,421
TOTAL ...	28,066	3,596	2,406	5,607	252	489	7,839	21,342

This represents a total weight of nearly 14 tons.

(7) DAMS

372. *Teso.*—Owing to food scarcity general fishing was authorised in all the Teso dams from April until the end of August; subsequently, these dams remained open to general fishing, though little advantage of this was taken by local Africans. There are plenty of *Tilapia esculenta* (*ngege*) and *clarias* (*male*) and some dams are now overstocked with the former.

373. A Senior fish guard investigated eight of the Teso dams during June and July at a time when all should have contained, and did contain, plenty of water. He reported as follows:—

(i) *Adoyi.*—Maximum depth 7 feet. Fishing has not started. Two species of duck occur, one being the knob-bill.

(ii) *Aketa.*—Maximum depth 8 feet. It is stocked with *ngege* and *male*. Local Africans are fishing with long lines and hooks, but catches are poor.

(iii) *Ngobo.*—This is the largest of the Teso dams, and has *ngege* in it. There are a few crocodiles and plenty of duck.

374.

(iv) *Arabaka.*—Some experimental fishing with a five-inch mesh gill-net was carried out in this dam during 1947, and it is said that 9 *ngege*, one *kasulubana* and 20 *mamba* were caught. No net fishing has taken place in 1948 because the net provided last year is worn out. No doubt the local folk are hoping for the free issue of another net! Cotton cultivation at this season has interfered with basket fishing which has temporarily ceased.

(v) *Amudoyi.*—There is no fishing at this time owing to cotton cultivation. This dam must be well-stocked with fish, as there are a few pink-backed pelicans on it.

(vi) *Aloet.*—This dam is very overgrown. It is said that during April, 1947, 31 *ngege*, 1 *semutundu*, 1 *kasulubana*, 1 *male* and 18 *mamba* were caught.

375.

(vii) *Dokolo.*—In 1947, experimental fishing with one five-inch mesh gill-net caught 1 *ngege*, 2 *kasulubana* and 6 *mamba*.

(viii) *Obuli.*—Experimental fishing with the above-mentioned net caught 22 *mamba*. There are some crocodiles in this dam.

(ix) *General.*—Little interest has so far been taken by local Africans to develop dam fishing. The African dam inspector, as opportunity offers, shoots crocodiles with a shot gun and S.S.G. in the few dams in which this interloper occurs.

376. *Game Warden's Tour.*—At the end of November the Game Warden visited the small dam at Abela, and the larger ones at Ngobo and Aketa.

(i) *Abela.*—Not particularly large; very overgrown with encroaching reeds and water grasses leaving an unduly small area of open water. Under present conditions could only support an extremely limited stock of fish. This dam was stocked with *nandere* (the local name for *ngege*) by the Game Department. It is accessible by car, by a good track less than $\frac{3}{4}$ mile distant from a main road.

377.

(ii) *Ngobo.*—This is a magnificent dam with a tremendous expanse of water which may be as much as five miles in circumference. Abundantly stocked with fish, as well as supporting quantities of water fowl, including four pink-back pelicans. Amongst the duck identified were—knob-billed (a few), white-faced whistling teal (abundant), Cape pink-bill (a few), white-backed diving duck (many), hottentot teal (plenty), and a few large packs of African pochard. Accessible by car along a good track of about $4\frac{1}{2}$ miles. Has been stocked with *nandere*.

378.

(iii) *Aketa.*—This is another fine dam with a wide expanse of open water, which has also been stocked with *nandere*. It is fairly deep all over as reeds and rushes have not encroached; there are a lot of large, white water lilies. It is four miles off a main road but is readily approachable by a well-maintained car track. It supports a few small packs of African pochard, and a few hottentot teal.

379.

(iv) *General.*—At the time of this visit there was no fishing on any of these dams. It is fully appreciated that stocking dams with fish can only be of secondary importance to the main purpose of these dams which is to provide water at all times for man and beast, and there can be no question of periodically emptying dams to re-fertilise the area which is the normal procedure in fish farming.

380. But in view of weed encroachment in varying intensity not only in Teso but in most dams in Uganda, which must have a definitely adverse effect on the volume of free water available, there is certainly the need for the introduction, if possible, of a weed-eating fish, which at the same time might be an economic asset. There is a species of *tilapia* obtainable from Northern Rhodesia which is a voracious weed feeder,

which may be just what is required for keeping dams free of unnecessary vegetation. But until exhaustive experiments have been conducted with this species locally in practical pond culture it would be most unwise, if not positively dangerous, to attempt any general introduction, as some voracious weed-eaters, for instance carp, not only clear a pond of vegetation, but then stir up the bottom to such an extent that the water is always turbid.

381. *Lango.*—At the end of November the Game Warden visited eight of the Lango dams, as a result of which he recommended that unrestricted fishing for all species of fish should be permitted forthwith. Notes on the dams visited are as follow:—

382.

(i) *Alidi.*—This is a small, new dam which is less than 3 years old and, in consequence is only partially filled. It contains a lot of fish, species not identified, as well as much aquatic vegetation in considerable variety. There is plenty of open water. This dam is two miles off a main road from which it is accessible by a good motor track.

383.

(ii) *Ngetta.*—This is a very small dam which was built in 1941 and contains fish, but could only support a very small stock. It has a lot of weed and water lilies, is fairly deep, but has a very restricted area of open water. Is close to a main road and has a good car approach.

384.

(iii) *Aler.*—A fair sized dam with plenty of open water; has a depth of 14 feet at the embankment, which drops to 12 feet during the dry season. Has a big stock of *nandere* which can be caught freely with worms, on hook and line. A lot of water lilies. Was built in 1943, but filled for first time in 1944. Two dozen white-backed diving ducks on it. It is alongside a main road.

385.

(iv) *Alibangyiro.*—Another roadside dam. A lengthy expanse of deep, open water. It was built in 1943, and filled for the first time in 1944. Has a good deal of water weed along the edge, and appears to contain a lot of plankton. 11 feet deep at the embankment. Has been stocked with *nandere.* A few water lilies, mainly white. One male knob-bill seen.

386.

(v) *Achake.*—This is another roadside dam which also was built in 1943 and first filled in 1944. Is 14 feet deep at the embankment, and contains many *nandere;* drops 2 feet in the dry season. In 1944 flooded seriously, when it was over 20 feet deep, and owing to an inadequate spillway very nearly washed away the embankment. A good expanse of open, clear water with apparently little plankton. A few water lilies.

387.

(vi) *Atan.*—Another roadside dam built in 1943, which first filled in 1944. 16 feet water depth at embankment, which drops 2 feet in the

dry season. Water lilies abundant along the edge, with much open water. White water lilies, which are more spectacular, appear to preponderate, but the blue are probably equally numerous. There seems to be a lot of plankton. It is plentifully stocked with *nandere*, and is said to contain many large *male*; also reported to harbour pythons. A pair of pigmy geese on it.

388.

(vii) *Agwang.*—Another of the roadside dams built in 1943 which first filled in 1944. A very small dam which has an embankment depth of 11 feet, and contains *nandere*. Has plenty of open water, and also vegetation quite distinct from all the other large dams visited. A thick fringe or mat of dwarf-sized Nile cabbage (*Pistia stratiotes*), and a tall, dense border of masses of a conspicuous, silver-coloured water weed: a few white water lilies. Said to be visited occasionally by crocodiles from the Moroto river.

389.

(viii) *Ayen.*—Another of the roadside dams built in 1943, which first filled in 1944. An extremely small dam with very discoloured water and containing little weed. Water level appears to have dropped considerably recently. 11 feet water depth at embankment. A very few white water lilies, and a fringe of yellow flowering, bulbous, water hyacinth. A few *nandere* and some *male*. One pink-bill duck on it.

390.

(ix) *General:*—

(*a*) The individuality of each of these dams is most striking.

(*b*) A botanical survey of each dam is necessary.

(*c*) All must be systematically water tested, as all seem to be different.

(*d*) Good photographs of each dam should prove of value.

(*e*) The introduction of a weed-eating species of *tilapia* will probably be beneficial.

(*f*) As no one was seen fishing it is advisable to encourage fishing by any practical method in all these waters.

(*g*) In addition to the introduced *nandere* most of these dams contain *male* (catfish).

391. *Acholi.*—By August nine dams had been completed in north-eastern Acholi, but they will not be ready this year for stocking with fish. Treating these dams with a weak solution of copper sulphate as an anti-bilharzia precaution is unlikely to prove inimical to fish life.

392. *Masaka.*—In mid-May the Game Warden investigated the large Kyazanga dam, and at the end of May visited this same dam as well as six others in this District.

393.

(i) *Kyazanga.*—This dam which is alongside the main Mbarara road some 30 miles out from Masaka has the appearance of a small lake, but, unfortunately, since much of its water was released a year ago to remedy the flooding of the road, it has dwindled alarmingly and is

nothing like its former expanse when it had a circumference of at least 10 miles. In the fortnight from 17th to 31st May it had further shrunk disastrously, and at the rate at which the Bahima cattle herds were watering there it seemed as if it would soon be drunk dry.

394. In mid-May it still maintained an abundant and varied collection of waterfowl including yellow-billed duck, knob-bill, pink-bill, hottentot teal, a pair of pigmy geese and a few spur-winged geese, as well as a couple of pink-backed pelicans and a dozen painted snipe (which were about to breed). In certain parts there is a good deal of aquatic vegetation, including a large patch of yellow flowering water hyacinth.

395. A fortnight later with the exception of a few ducks and geese most of the waterfowl had disappeared although the two pink-backed pelicans were still there, and only one painted snipe was seen. A number of dead *ngege* were lying in water only a few inches deep. One saddle-billed stork was observed.

When water conditions permit a certain amount of fishing takes place with scoop baskets.

396.

(ii) *Mbirizi.*—This is a very small dam, too small in fact to support any waterfowl, but is said to contain a few *ngege.* It is about half-a-mile off a main road and in dry weather is accessible by car.

397.

(iii) *Kyebondogoto.*—This is a small dam of considerable promise which one day may expand considerably. It was the first of the Masaka dams to be stocked with *T. esculenta* and supports a lot of fish life. It always seems to be patronised by one saddle-billed stork, and it also has a number of yellow-billed duck and knob-bill.

It is about a mile off a main road and in dry weather is accessible by car.

398.

(iv) *Kabulangiti.*—This is a tiny dam about the size of a large pond, and is close to a main road. It contains some *ngege* but is too small and exposed for waterfowl.

399.

(v) *Kikoma.*—This is another small dam, which also contains *ngege.* It has no duck and very few waterfowl. It is about a mile distant from a main road and in dry weather is accessible by car.

400.

(vi) *Ntusi.*—This is a delightful dam of fair size which is likely to double or treble its expanse in a really wet season. It has a fairly even depth of several feet throughout and is full of *ngege*; *male* are also said to be plentiful. A very attractive, large white water lily is abundant.

In addition to a few dozen knob-bill and a pair of yellow-billed duck it supports some extremely interesting waterfowl including the little water hen (*Gallinula angulata*) and the lesser purple coot (*Porphyrio alleni*).

401. This dam is about a mile off the main road and is inaccessible by car. About a quarter-of-a-mile before reaching the dam, and well above it, is a small subsidiary catchment which after heavy rain can develop into a large pond. It is very overgrown with weed, contains no *ngege*, and supports a few waterfowl including a pair of yellow-billed duck.

402.

(vii) *Kamengo* (*Biwolobo*).—This is a fine dam of considerable extent which undoubtedly will expand a great deal. It is approached by a two miles long track which should be passable for cars most of the year. There are a lot of *ngege* but whether they are *T. esculenta* or *T. nilotica* is not yet known. At certain seasons a lot of fishing is conducted with basket traps. Evidently fish are plentiful as three fish eagles were seen.

403. There is deep water near the embankment, and 13 white-backed diving ducks frequented this part. Elsewhere there were a dozen spur-winged geese, a pair of hottentot teal, a few yellow-billed duck and one knob-bill. Other waterfowl were present in considerable variety. Aquatic vegetation is varied and interesting and includes blue water lilies in abundance, yellow water hyacinth, a tall thick-leaved plant with white flower spike and a certain amount of water cabbage (*Pistia*).

404.

(viii) *General.*—Until water conditions show a substantial improvement the development of fisheries in any of these dams is impossible.

(8) INTRODUCTIONS

405. During 1948 there have been no fish introductions.

(9) FISH TRANSFERS

406. *Vide* paragraph 358 *Tilapia nilotica* from Lake Nakavali have been transferred to two other small lakes in South Ankole, e.g. Lake Mburo and Lake Mikera, in order to speed up stocking.

(10) CROCODILES

(i) *Control*

407. *Lake Victoria.*—During the months of August, September and October, as well as part of November, the annual campaign against female crocodiles on the breeding grounds was conducted as usual.

Sese operations were hampered considerably by late laying which did not commence until after mid-August; by a lot of nest destruction on the part of local fishermen which thereby enabled many breeding females to escape; and by numerous difficulties in the provision of a suitable launch. Notwithstanding all these troubles the results achieved can be considered satisfactory.

156 crocodiles were destroyed, almost the same number as last year (152).

408. Crocodiles killed (mainly breeding females), nests found, and eggs destroyed, were:—

	Crocodiles killed	Nests found	Eggs destroyed
	156	169	9,420
In 1947 ...	152	184	9,128

409. There are, unfortunately, plenty of large crocodiles still left. In the Damba to Katebo region large females killed were twelve of 11 feet and over, and three of 12 feet and over and two exceeding 13 feet. Large males killed in the same area were five of 12 feet and over, seven of 13 feet and over, and three of 14 feet and over the largest being 14 feet 2 inches. The abundance of large males in these waters is noteworthy.

In the Sese region the score was eight females of 11 feet and over, one of 12 feet and over and one of 13 feet. The number of small sized breeding females was remarkable there being no less than 17 below 9 feet (three of them less than 8 feet), and sixteen between 9 feet and 10 feet.

Outsize males killed in the same area were one of 12 feet 8 inches, one 13 feet, one 13 feet 6 inches, and one 14 feet 6 inches.

410. The tally of nests containing 70 eggs or over was: in the Damba to Katebo region, five of 70 or over: in Sese, eleven of 70 or over, and one of 86.

411. *Loan of Weapons.—Vide* paragraph 344, 1947, the same member of the public using a Game Department weapon has during the year destroyed a total of 461 crocodiles, a most satisfactory performance which is of inestimable benefit to the local inhabitants, and to the fisheries. At times this marksman also used a high powered ·22 rifle which proved most effective and which has remarkable powers of penetration. On one occasion its solid bullet had penetrated the crocodile's bone mass between the eyes, travelled into the brain cavity, turned and emerged through the lower jaw: another time the bullet had gone through the shoulder which was smashed and had carried pieces of bone into the lungs.

412. *Lake Nakavali.—Vide* paragraph 357 it has been necessary to take vigorous action against the numerous, destructive crocodiles. During January 29 crocodiles, one being a huge male 16½ feet in length and another of 14½ feet, were killed. The largest one had been raiding fishing nets and contained 30 to 40 *ngege* and pieces of net. Further details will be found in paragraphs 334–340 of the Fish Culturist's report.

Inconclusive poisoning experiments were made with nicotine sulphate and nicotine.

413. *Lake Kachira.*—It has not been possible to take control measures against the crocodiles in this lake. Unfortunately, no use has been made of a licence issued to a non-native company to catch crocodiles.

414. *Lake Nabugabo.*—Crocodiles still frequent this popular resort, and from time to time are observed by visitors.

(ii) *Industry*

415. *Lake Kyoga.*—The Lake Kyoga crocodile skin industry is slowly reviving, and although it may be possible to approach previous output in quantity there is no doubt that quality has declined and cannot recover at the present rate of killing. Five years ago the average weight of a skin was 45 lb., two to three years later it had fallen to half this weight, now it is only 10 lb.

416. The percentage of "button" skins continues to be high. There are certain authorities who insist, with some justification, that "button" crocodiles are specifically separable: according to others "buttons" are due to some defieiency in diet.

417. *Semliki River.*—Some exploratory work has been permitted in this region under lieence, but few crocodiles have been caught as there are numerous difficulties to be overcome. Skins from this locality, however, average large.

(iii) *General*

418. *Congo Forest River Crocodile* (*Osteolaemus tetraspis*).—Somewhat of a sensation was caused in October by the discovery of a small crocodile in a prospecting pit near the Hoindagi river which flows into Lake George from Ankole.

The occurrence of a crocodile in this region which hitherto had been believed to be crocodile-free naturally evoked considerable speculation and misgiving. But actually there was no cause for alarm as it proved to be a species which is exclusively a river and not a lacustrine creature, and it can only breed under eertain conditions of semi-aquatic forest which enable it to incubate its eggs in a mound of dead leaves and other vegetable matter, and their hatching is abandoned to the heat of fermentation. This specimen was moved to a more convenient pit where it was regularly fed and at the end of the year it was alive and flourishing. Some excellent photographs were taken for purposes of record. As a result of comprehensive enquiries there is reason to believe that this little crocodile also occurs in some of the Ankole and Kigezi rivers which flow into Lake Edward.

419. *Aswa* (*or Moroto*) *River Pigmy Crocodile.*—Reference has been made in previous Reports *vide* paragraphs 310–311, 1929, paragraphs 200–201, 1930, and paragraphs 223–224, 1933, to a pigmy species of crocodile which is found in eastern Uganda in the Aswa (or Moroto) river and the Greek river.

Science has been reluctant to admit that these pigmies have specific status and prefers to regard them simply as dwarfing, due to environment, of *Crocodilus niloticus.*

420. In January, however, some eggs of the Aswa pigmy crocodile were examined and it was found that they too were conspicuously dwarfed measuring only, in millimeters, 69·0 by 40·2 and 67·2 by 40·3, which contrast remarkably with 80 by 49 millimeters, the average of the normal Nile crocodile.

Also, the Nile crocodile averages about sixty eggs per nest, but this pigmy crocodile's "sitting" was only twelve eggs. One cannot help feeling that the Aswa pigmy crocodile has developed into a definite species, or at least a recognisable race.

421. *General.*—At times one receives strange requests. This year the Department was asked to send by air to South Africa three dozen newly hatched crocodiles!

The Department was prepared to comply with this request, but nothing further developed from the initial enquiry.

(11) GENERAL NOTES

422. *Maximum Weights of Fish.*—The heaviest fish recorded are:—

	Lake Victoria	Katwe	Katunguru	Kaianja
	lbs.	*lbs.*	*lbs.*	*lbs.*
Ngege	3– 4	3– 4	5– 6	2
Semutundu	30–35	33–35	35–41	...
Kasulubana	10–15	8–10	8–10	...
Kisinja	8–25	8	10–30	...
Male	31	32–40	31	...
Mamba	32	42	32–40	...

423. There is little outstanding amongst these weights, with the possible exception of 25 lb. *kisinja* from Lake Victoria; from Katunguru 41 lb. *semutundu*, 5 lb. to 6 lb. *ngege*, and 40 lb. *mamba*; and 40 lb. *male* and 42 lb. *mamba* from Katwe.

424.

(i) In the course of a visit to the Congo fisheries in the southern part of Lake Edward the Fish Culturist was informed that the heaviest *bagrus* which had been caught in a seine net weighed 346 lb.—it must have been a veritable monster of truly exceptional size. Also, another immense fish was a *male* of 276 lb.

(ii) The mystery fish, the *ngiriso* (or *engiliso*), which is referred to in paragraphs 492–493, 1935, paragraph 219, 1937, and paragraph 293 (iv), 1946, is well-known to the Belgians who say that about seven or eight are caught each year. It is described as having the head of a *bagrus* and the tail of a *clarias*, which is the exact opposite of what is recorded in paragraph 219, 1937. It is believed to be a deep water species and those caught have never been less than 80 lb., the heaviest was about 95 lb. It is found mostly along the northern coast.

(iii) Soft-backed Turtles (*Trionyx* sp.) whieh have not previously been recorded from Lake Edward are sometimes caught by the Belgians, in deep water.

425. *Fish Mortality.*—No reports of fish mortality have been received from any of Uganda's lakes or rivers.

It is believed that the *ngege* mortality in Lake Bunyonyi, which was recorded in paragraph 297 (iii) of the 1946 Report, Part II, Fisheries, was almost certainly due to a terrific blooming of *spirogira* which reduced the saturated oxygen in the water to such an extent that the fish died for lack of oxygen. The blooming of course exhausts the oxygen in the water and the *spirogira* in its turn dies off, so that the water soon clears. The *spirogira* is a filamentous *alga*.

It is possible, though by no means certain, that the periodical heavy mortality which occurs amongst the Lake Albert Nile perch may also be due to blooming of *spirogira*.

426. *East African Freshwater Fisheries Research Organisation.*—Good progress has been made with the building programme, the Laboratory and several staff quarters have been completed and others are under construction. Two motor launches are in constant use.

The principal investigation so far undertaken has been a preliminary survey of the fish population in the Jinja area of Lake Victoria. This has already given indication of promising lines for economic development of the fisheries.

427. *The Uganda Fish Marketing Corporation, Ltd.*—This is the Public Utility Company which is referred to in paragraph 357 of the 1947 Report. The Uganda Fish Marketing Corporation, with a capital of £50,000, in which the Protectorate Government holds the majority of shares, was incorporated in October. The Corporation plans to operate at Lakes George, Edward, Albert and Kyoga, as well as at sundry other smaller inland waters but not, for the present, on Lake Victoria. The objects of the Corporation are essentially to organise the processing and marketing of fish and other lake products so that the African fishermen will be assured of a steady long-term market for their catch at a fixed and fair price. There will be no interference with the fishermen themselves, and the satisfactory development of Uganda's fishing industry is considered to be of primary importance.

The Game Warden *ex officio* is a Director of the Company and attended all but one of the Board meetings.

428. The Corporation has acquired the fish and crocodile interests of Uganda Lakes Ltd., a Company which was operating on Lake Kyoga, Lake Albert and Lake Kijanebalola (Masaka).

By the end of the year a nucleus of European staff had been engaged to carry on these various activities.

429. *Fish Farming.*—Preliminary investigations have been carried out in an endeavour to find suitable localities in western Ankole and the adjacent portion of the Toro District in which free flowing streams might be used to supply the necessary water for experimental fish farms. One such locality examined in August at the Kilembe mining headquarters, at the foot of Ruwenzori, by the Game Warden and the Fish Culturist was found to be most suitable, but, unfortunately, the contemplated development did not materialise.

430. A large business concern owning plantations of considerable extent in several parts of Buganda has been constructing dams wherever possible on its properties and stocking them with *Tilapia esculenta* from Lake Victoria.

431. *Fish Culture.*—Little fish culture has been possible though the few aquarium experiments conducted by the Fish Culturist have revealed how voraciously *Tilapia nilotica* feeds on water weed, and also that wherever this species occurs it will be the dominant *tilapia.*

432. *Pelicans.*—Pelicans play an important part in the economy of the shallower lakes which are well stocked with valuable food fishes, and in particular in parts of Lake Edward, Lake George and the Kazinga Channel.

As these large, voracious birds are exclusively fish-eaters it has been necessary to investigate carefully the extent of the damage they may cause to local fishing industries.

433. Two species of pelican occur in Uganda, the larger one or rosy pelican—*Pelecanus onocrotalus* and the lesser or pink-backed pelican—*Pelecanus rufescens*. The rosy pelican is seasonally migratory, when a large proportion of these birds move away, probably to breed; the pink-backed on the other hand is resident and nests in colonies in trees, usually not at a very great distance from the waters in which it obtains its food. Its breeding season is during the four months August to November. No East African breeding ground of the larger species has yet been located, but the state of the sex organs of males and females collected on Lake George in July indicated breeding later in the year, and nesting is believed to take place during the October to end of January period. There is usually a considerable lessening of rosy pelicans in the Lake Edward/Lake George region from November to February.

434. The pink-backed pelican is dealt with first as the examination of a number of specimens indicates that it does little harm to the economic fisheries as its catch consists mainly of a small sized predator cichlid fish which can well be spared, in fact it is possible that the activities of this bird are to a great extent beneficial.

435. The rosy pelican on the other hand does incredible harm to the economic fisheries, and it is estimated on reliable evidence that one of these birds consumes at least one ton of valuable food fish per annum, a formidable total. It is known from frequent local examinations that a single rosy pelican catches at least 6 lb. of fish, mainly if not entirely *ngege*, per day, and, unfortunately, a large proportion of these *ngege* are breeding females, as in Lake Edward these pelicans' favourite fishing grounds are in the shallows at the mouths of rivers which are the main *tilapia* breeding grounds.

436. The majority of *tilapia* which have been found inside rosy pelicans are either fish about to spawn or fish with the pharynx packed with ova or fish carrying their broods in their mouths. In consequence the damage caused to the valuable *tilapia* fishery of Lake Edward and its associated waters is incalculable.

437. During the years 1937 to 1941 investigations carried out on Lake Naivasha in Kenya Colony indicated that the rosy pelican consumed at least 11·15 pounds of fish, entirely *tilapia*, per day.

438. In consequence the presence of a few thousands of rosy pelicans on the waters of Lake Edward, Lake George and the Kazinga Channel for a greater part of the year presents a problem of very great economic importance; worse still is the fact that the rosy pelicans fish both by day and night.

439. *Isinglass.*—Isinglass is a pure form of commercial gelatine with certain valuable properties which are not found in other gelatines. In particular it is used for fixing or clarifying beers and wines, and also it is of great importance to the leather trade as it is the strongest known leather cement. It is found in the walls of the swim-bladder (otherwise known as the "sound" or "maw") of certain species of fish. Sounds are bought by weight when thoroughly dried, and normally the sound of the female is much heavier and more valuable than that of the male fish of the same species.

440. The sound is extracted without stretching or tearing when the fish is gutted; it is split with a sharp knife from end to end, and hand washed in running water to remove all blood and attachments of connective tissue. It is then air- or sun-dried until it is stiff and hard. An average price for mixed sounds is about Shs. 8 per lb., but the highest quality may fetch as much as Shs. 24 per lb. The bigger and thicker the bladders, the higher the price. The local production of swim-bladders for isinglass would not only conserve hard currency, but also would contribute to dollar earnings by the export of increased quantities of the manufactured product to the United States.

441. An examination of the sounds of the various species of fish which are found in Lake Edward and its associated waters indicates that the *semutundu* (*Bagrus docmac*) is the only one which provides a satisfactory bladder. As a by-product the collection of its sound might be worth while, though the price offered of Sh. 1/9d. per lb. delivered in the United Kingdom is unattractive, representing as it does a local price of only Sh. 1 per lb. The bladders of *mormyrus* and *barbus* are of good quality, but too small, and as the supply is extremely limited their collection is not an economic proposition. *Clarias* bladders are small and useless, the sound of this fish is in the skull.

442. At the end of the year, in addition to the *semutundu* material previously sent to the Colonial Fisheries Adviser, a consignment of bladders from some of the larger Lake Albert species was submitted for expert examination and report.

The Nile perch (*Lates albertianus*) sound is large and provides isinglass of high quality, and the trade is prepared to pay Shs. 4 to Shs. 5 per lb. for these bladders.

The *wachone* (*Distichodus niloticus*) also has a valuable sound, but larger samples will have to be submitted before it can be priced.

443. The air bladders of the *mpoi* (*Citharinus citherus*), *wahrindi* (*Synodentis schall*) and *karuka* (*Labeo horie*) are of no commercial value. Until the processing of the catches from Lake Edward and Lake Albert is properly organised there can be no satisfactory development in the production of dried sounds.

444. *Identifications.*—Some small sized *tilapia* caught in the little crater lake Niungu, near the Catholic Mission at Kichwamba and the road to Katunguru, have been identified with *Tilapia trewavasae* at the British Museum (Natural History). This crater lake is not connected with either Lake Edward or Lake George. There is considerable confusion of identity of the *tilapias* which are found in the various crater lakes in western Ankole and in Toro, and it appears that *trewavasae* in its various forms is so close to *Tilapia eduardiana* that it is in fact a form of this species. Moreover, *Tilapia eduardiana* and *T. leucosticta* may prove to be the same. In Lake Niungu *T. trewavasae* is very black. This species also occurs in Lake Isunga not far from Fort Portal, and in the British Museum collection at South Kensington there are also specimens from a crater lake, at an altitude of 3,500 feet, near Mohokya.

(C) Angling

TROUT

445.

(i) *Brown Trout.*—No reports have been received of either conditions or catches from the Ruwenzori streams.

446.

(ii) *Rainbow Trout*—

(*a*) *Bukwa River.*—Fishing generally has been poor, and re-stocking with rainbow "fry" from Stellenbosch (South Africa) ova is contemplated by the Suam and Kaptega Angling Association.

447.

(*b*) *Suam River.*—In the Suam also fishing has been poor, and re-stocking is contemplated. At the end of the year when conditions were said to be ideal anglers found fish scarce, and those taken averaged ¾ lb., the best being 1 lb.

448.

(*c*) *Siti River.*—Nothing to report.

449. *Suam and Kaptega Angling Association—Honorary Members.*—The Suam and Kaptega Angling Association has invited the County Chief of Sebei, the Gombolola Chief of Bukwa and the Muluka Chief, Suam, to become Honorary Members of the Association, a privilege which is very greatly appreciated by the trio concerned.

450.

(iii) *Trout Licences.*—The revenue derived from the sale of Trout Licences amounted to £28 19s., which is an eighty-three per cent. increase on last year.

451. *Nile Perch or Mputa—Lates albertianus.*—No definite news has been received about Nile perch fishing which, however, is believed to be still indifferent.

452. *Ripon Falls Barbel.*—Fair sport has been had below the Ripon Falls, and at the Owen Falls, by local enthusiasts and visitors.

453. *Tilapia variabilis.*—Angling for *Tilapia variabilis* above the Ripon Falls at Jinja continues to provide a profitable pastime for numerous Africans. It is remarkable how contemptuous these fishermen are of the abundant lurking crocodiles, as they make a practice of wading far out into the shallow water where they will stand for hours on end hopefully angling. Although casualties occur this does not deter the others from asking for the same trouble.

C. R. S. PITMAN,
Game Warden.

ENTEBBE,
28TH FEBRUARY, 1950.

I.—LAKE VICTORIA—WESTERN MENGO. FIVE-INCH NETS

Landing	Days	Nets	Hooks	Baskets	Ngege		Semutunda		Kasulubana		Kisinja		Male		Mamba		Ningu		Nkeje		Nzere		Mpongo		Total	
					No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.
Nakiverje	291	52,805	..	..	71,410	109,254	13,153	19,736	13,568	26,466	3,045	10,683	1,048	5,421	173	1,167	4	4	..	..	..	..	3,631	4,158	106,036	176,891
Nakitulube	250	20,495	..	1,600	24,620	37,482	12,760	17,640	19,873	37,806	1,371	4,913	744	3,676	81	533	3	20	6	1	1	..	2,798	3,216	62,272	105,037
Katebo	182	14,084	3,500	183	75,551	114,973	10,620	21,356	4,959	10,855	2,569	9,332	251	1,474	220	1,360	1	1	..	..	..	..	2,589	3,338	97,869	163,689
Bugonga	163	6,899	35,464	..	2,747	4,157	4,431	14,043	7,937	13,364	318	1,908	358	2,111	63	593	..	..	..	..	..	..	538	681	15,694	37,457
Kyanyuzu	48	2,647	..	..	1,364	1,975	40	194	87	131	23	73	10	39	4	26	..	..	..	..	..	..	12	10	1,360	2,449
Nakiwogo	111	4,022	..	..	2,144	3,070	201	731	266	484	63	166	5	24	..	..	1	6	..	..	..	..	96	95	2,776	4,575
Bunoga	159	5,528	..	..	10,100	15,320	1,472	4,910	837	1,587	165	540	143	902	31	441	..	..	..	..	..	..	643	731	13,387	24,172
Kyasura	12	325	..	..	122	201	30	99	20	45	1	5	1	3	..	..	..	..	..	..	..	..	43	45	223	398
Kaseri	21	958	..	..	2,440	4,799	246	945	133	258	34	161	25	172	7	93	..	..	..	..	..	..	409	459	3,294	4,991
Derwe	25	633	..	..	499	757	140	360	71	234	18	44	4	15	6	40	..	..	..	..	..	..	59	67	797	1,407
Buku	4	132	..	..	61	84	4	17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	3	68	104
Mukuba	123	7,564	..	7	9,697	14,224	1,780	6,440	1,334	2,916	220	714	197	998	90	692	..	..	..	..	..	..	1,270	1,580	14,588	27,564
Lwaka	38	301	10,600	..	132	201	244	352	21	14	12	30	168	640	80	389	..	..	..	..	..	..	11	10	348	1,812
Lwanjaba	68	1,821	..	..	1,083	2,061	936	3,027	1,036	3,092	87	340	52	305	6	39	..	..	..	..	..	..	297	342	4,399	8,969
Kasenyi	130	4,594	900	..	2,943	4,413	1,278	5,794	3,207	6,440	266	937	139	694	17	112	..	..	..	..	..	..	495	546	10,346	22,906
Kiwani	121	..	..	93,288	23,732	39,352	1	1	2	7	1	4	424	1,284	1,660	8,964	1	1	..	..	..	..	4,374	3,206	31,593	48,930
Kazikake	68	2,574	..	117	4,984	7,066	1,703	6,456	460	830	484	1,566	297	911	12	74	..	..	..	..	..	..	403	238	8,143	16,830
Kasiru	16	344	2,000	..	641	863	104	380	3	7	11	44	8	29	..	..	..	..	..	..	..	..	24	24	771	1,347

II.—LAKE VICTORIA—EASTERN MENGO (INCLUDING KOME ISLAND). FIVE-INCH NETS

Landing	Days	Nets	Hooks	Ngege		Semutunda		Kasulubana		Kisinja		Male		Mamba		Nkeje		Mpongo		Total	
				No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.
Kasirye	70	2,445	..	3,193	4,445	373	1,152	645	324	38	128	19	72	5	35	..	..	1,383	2,322	5,666	7,668
Katosi	166	14,858	700	25,304	37,776	11,334	33,945	8,017	16,615	1,114	3,430	670	3,533	30	202	..	..	3,617	5,396	50,086	99,003
Kiruba	98	11,843	..	15,678	23,707	1,233	4,019	449	918	162	610	314	1,484	29	204	..	..	375	473	18,238	31,415
Munyinyo	84	2,829	..	2,546	3,854	274	974	346	714	48	142	87	422	5	37	..	..	458	477	3,761	6,818
Kirinda	18	468	..	213	378	234	842	12	21	4	10	7	27	..	..	..	..	47	56	710	1,538
Kazikake	107	9,951	..	9,082	14,207	5,341	16,746	8,294	15,829	604	2,305	319	1,933	19	146	4	5	1,514	1,891	25,177	52,710
Nakitulube (Kome)	61	6,661	..	14,325	21,378	3,969	8,810	3,664	10,059	276	933	173	815	67	108	..	..	2,317	1,785	24,941	43,882
Mjovo (Kome)	9	814	..	488	753	1,766	5,174	1,036	2,182	71	270	59	193	2	17	..	..	6	6	3,368	8,395
Kagunde	3	88	..	375	822	3	7	..	..	..	..	..	..	..	..	..	..	..	..	378	831
Kazikake (Kome)	83	6,947	..	14,334	22,048	2,064	9,553	4,531	8,732	261	1,055	148	724	17	139	..	..	1,930	2,301	24,185	44,752

III.—LAKE VICTORIA—MASAKA DISTRICT (INCLUDING SESE ISLANDS). FIVE-INCH NETS

Landing	Days	Nets	Hooks	Traps	Ngege		Semutunda		Kasulubana		Kisinja		Male		Mamba		Ningu		Nkeje		Nzere		Mpongo		Total	
					No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.
Mubanzi	136	2,749	3,227	..	1,882	3,026	141	648	16	38	8,976	34,397	443	831	112	1,549	155	220	..	..	..	..	25	22	11,447	40,731
Bukakata	80	1,045	30,333	161	783	1,229	1,415	3,599	459	956	496	1,471	673	2,019	85	247	..	..	..	..	..	..	165	123	3,852	12,736
Lugobu	16	792	..	..	12	16	950	3,211	1,221	2,714	101	463	15	90	..	..	..	..	..	..	..	..	44	44	2,344	6,538
Musangano	16	..	3,063	..	..	..	1	3	..	..	1	8	20	119	74	837	..	..	..	..	..	..	..	..	96	967
Nansere	48	..	..	341	803	1,081	9	28	..	..	3	9	138	378	10	510	3	3	..	..	..	..	464	197	1,470	3,203
Dimu	6	..	17,137	..	..	..	80	276	..	..	18	48	128	419	94	1,393	..	..	..	..	..	..	..	..	298	2,131
Kalwanya (Sese)	128	13,227	..	..	23,567	35,494	4,531	18,332	5,803	10,910	531	1,951	318	1,846	251	844	..	..	..	..	..	..	13,600	16,402	48,278	83,279
Kajolomolo (Sese)	125	8,853	..	..	26,734	39,221	3,139	11,151	1,804	3,3144	289	1,022	261	1,252	26	176	..	..	..	..	..	..	6,803	7,074	36,550	64,110
Bugoma (Sese)	36	2,113	..	..	3,312	4,821	1,478	5,795	896	1,744	147	503	59	279	1	8	..	..	..	..	..	..	369	294	6,272	13,510
Lukindu (Sese)	13	1,075	..	..	3,211	4,857	179	748	64	98	11	31	16	36	..	..	..	..	..	..	..	..	1,081	1,353	4,504	7,101
Bungo (Sese)	90	9,549	..	..	33,205	48,611	2,569	9,779	1,126	2,569	242	1,3864	505	2,597	31	200	..	..	..	..	..	..	3,141	2,903	40,418	67,724
Mutambala (Sese)	54	3,434	..	..	11,293	16,389	1,130	4,376	467	921	94	313	25	147	2	44	..	..	..	..	..	..	2,595	2,869	15,811	25,059
Kamkulo (Sese)	89	7,150	..	..	18,872	27,908	2,779	10,782	3,013	5,379	280	961	158	858	14	119	..	..	..	..	..	..	4,933	5,459	30,051	51,315
Kibanga (Sese)	40	1,153	..	..	4,128	6,052	255	1,020	201	340	40	120	10	47	1	5	..	..	..	..	..	..	71	78	4,707	7,671
Kome ...	100	7,192	60,427	..	691	1,094	184	1,114	39	58	134	609	294	1,475	430	5,607	1	1	..	..	24	13	2	8	1,286	9,762
Kasuwuriga	101	1,418	775	619	4,361	6,186	1,043	2,592	815	810	141	480	2,487	5,269	689	3,049	43	42	152	543	277	119	2,162	1,896	12,158	22,497
Igoma	93	..	51,074	..	..	..	131	823	..	..	58	164	330	1,655	476	6,230	..	..	..	..	13	6	..	..	588	9,078
Kasensero	30	15	9,606	..	37	56	61	388	3	9	17	73	75	374	59	863	1	1	..	..	..	..	..	..	353	1,740
Namirembe	55	..	42,850	..	..	..	1,061	7,640	..	..	242	860	263	1,019	22	289	..	..	..	..	..	..	..	..	2,068	9,810
Bale	31	102	40,166	..	54	238	1,171	6,510	12	32	169	662	272	1,175	34	566	8	8	..	..	..	..	5	10	1,721	9,339

IV.—LAKE VICTORIA—JINJA. FIVE-INCH NETS

Landing	Days	Nets	Hooks	Traps	Ngege		Semutunda		Kasulubana		Kisinja		Male		Mamba		Ningu		Nkeje		Nzere		Mpongo		Total	
					No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.
Mawua	248	31,034	..	..	121,035	182,307	11,909	33,458	5,031	8,805	1,129	4,304	656	2,915	154	977	..	..	21	6	..	..	2,828	3,343	145,761	234,217

V.—LAKE VICTORIA—SMALL MESH NETS—VARIOUS LANDINGS

Landing	Days	Nets	Ngege		Semutundu		Kasulubana		Kasinja		Male		Mamba		Ningu		Nkeje		Nsere		Nsogo		Mpongo		Total	
			No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.
WESTERN MENGO																										
Nakiyenje	29	625			76	41	1,304	449	187	70	6	8			1,001	461	1,854	287	58	23	21	5			3,907	1,344
Bugonga	107	3,145			512	349	7,669	2,975	176	80	2	9			2,527	1,520	1,432	2,383	398	118	1,317	922			16,423	8,399
Kateebo	31	2,171	278	99	113	83	147	85	12	15	191	148	35	30	1,193	642	1,856	921	2,286	1,114	535	146	98	48	9,126	3,630
Nakifuluba	12	150			59	23	229	84	38	16	1	2			180	135	171	38			17	1	17	4	501	365
Mukuba	16	136			22	10	172	64	6	2	3	9			178	104	502	70			34	4			917	360
Kasenyi	27	500	1	1	146	994	902	372	246	76	1	3			785	489	735	228			37	13	92	27	2,849	1,805
Dewe	23	302			26	30	2,101	600	45	9					55	19	1,239	224	195	58	668	138			4,329	1,458
Lwanjaba	10	130					75	24	27	21					194	97	241	47	24	3	70	15			532	209
Gollo	9	278			14	6	2	1	3	2	8	10			446	269	253	74	27	9					753	371
Lwaba	8	48													10	3	421	78	19	6	212	57			664	138
EASTERN MENGO																										
Katosi	16	336			43	21	298	100	117	49					588	287	303	77			6	1	147	34	1,500	563
Kirubu	6	60			59		116	39	3	1					11	5	120	46							250	141
Kanikeke (Nome)	8	200			77	41	231	87							642	491	343	87							1,533	895
MASAKA																										
Masahgama	73	4,173	24	184	64	46	345	176	56	951	23	59	1	1	32,534	35,852	778	55	286	1004					40,194	38,453
Mubanzi	77	3,184	9	6	12	49	293	131	74	66	21	96	2	4	28,079	24,886	68	21	289	115	1				29,810	25,376
Iguma	63	7,025	15	9	112	63	186	76	304	429	16	46	1	8	52,431	51,310	1,808	512	726	436					55,899	52,389
Kyasa	59	6,384	4	7	32	25	61	31	93	36	13	40	4	24	49,615	48,077	646	193	226	72					50,604	48,548
Nansere	10	150			4	4	33	19	15	16	11	7			299	193	137	42	63	24			5	2	571	309
Lambu	2	108			1	2	33	9	10	3					210	135	80	25	31	3					373	169
Kaziya	22	176													537	385	91	36	46	13					676	434
Namiremhe	26	1,273			2	5	11	3		963	464				4,252	2,861	1,689	390	157	54	43	7	3	2	5,952	3,783
Bale	33	951			7	5	12	3		14	26				3,370	2,857	978	111	30	12	27	4	54	39	4,491	3,049

VI.—LAKE VICTORIA—SEINE NETS—ENTEBBE, MENGO AND MASAKA DISTRICTS

Landing	Days	Seine Nets	Ngege		Semutundu		Kasulubana		Kasinja		Male		Mamba		Ningu		Nkeje		Nsere		Nsogo		Mpongo		Total	
			No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.
WESTERN MENGO																										
Bugonga	132	205	60	87	339	580	792	380	90	35	25	104	5	60	561	72	1,205,121	22,001					3,073	2,047	1,210,024	29,259
Kateebo	36	66	25	30	28	108	33	64	4	11	51	176	13	167	33	7	360,934	14,445	6	3	45	10	527	400	361,698	15,322
Nakifuluba	15	55	16	21	84	158	86	74	3	2	3	33	1	8	21	4	139,041	3,993			123	18	83	62	139,354	5,097
Kasenyi	91	111	30	31	214	369	594	417	12	22	12	38	9	113	8	3	698,204	17,285					4,749	1,597	703,822	19,877
Mukuba	26	36			3	9	9	7	3	8	4	10	1	2			160,530	5,100					164	82	160,742	5,206
Kanikeke	12	12	6	4	32	27	58	16			6	21	1	9	7	4	15,003	2,977					133	57	15,182	3,063
EASTERN MENGO																										
Katosi	87	25	141	224	6	29	335	198	1	1	1	1					135,116	3,567					1,164	619	136,427	4,862
MASAKA																										
Bukakata	111	535	85	120	199	718	2,522	4,649	51	28	60	277	37	423	140	74	1,614,370	55,944	41	28	256	33	3,683	2,576	1,619,449	84,072
Namiere	166	765	108	123	417	1,041	1,286	2,195	58	97	222	618	35	348	136	60	2,636,041	62,843	370	92	329	46	9,321	6,302	2,648,690	74,116
Lambu	33	33	8	11	32	89	66	122			7	28	1	12	5	4	209,110	6,000					366	200	209,597	6,486
Iguma	74	131	1,286	1,820	91	427	52	206	43	132	225	471	52	849	390	243	408,470	13,941	4	2			1,544	1,105	501,956	18,994
Namiremhe	59	335	10	12	498	1,361	23	78	619	368	122	273	51	242	257	160	1,130,847	52,483	204	67	5,996	1,522	20,990	18,893	1,158,287	73,181
Bale	59	174	8	14	94	421	35	200	91	98	28	118	9	178	146	59	491,815	18,002			888	132	14,063	11,628	507,211	31,779
Kasira	31	31				17	48	221	4	2							107,510	2,853					108	84	110,438	3,762
Dimu	6	11							16	3	9	3	1	20			15,801	1,340			65	11	33	15	16,921	1,392
Kasensere	14	53	41	33	38	42	1	1			1	7	8	117	10	10	116,490	2,239					161	99	116,758	2,507

VII.—LAKE VICTORIA—DRIED FISH—VARIOUS LANDINGS

Landing	Days	Ngege		Semutundu		Kasulubana		Kasinja		Male		Mamba		Ningu		Nkeje		Nsere		Nsogo		Mpongo		Total	
		No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.	No.	lbs.
WESTERN MENGO																										
Nakifuluba	1			63	79			18	31	3	8													94	118
Kasenyi	1			66	73	270	416	7	9	10	15													353	513
EASTERN MENGO																										
Katosi (Nome)	2			227	276	1,028	982			33	87													1,308	1,300
Nassazza (Buvuma)	3			2,900	2,482	2,080	785	52	34							1,000	220							5,992	3,521
Mwema (Buvuma)	3			3,821	2,310																			3,821	2,310
Kigombe (Buvuma)	4	20,306	8,479	280	126																			20,586	8,605
Lumu (Buvuma)	4			6,308	5,991	984	393	62	128	3	4					1,866	318	134,076	516					143,293	7,374
Zira (Buvuma)	3			7,843	5,657	1,120	440									5,240	853	859	41					15,062	7,030
Bunsi (Buvuma)	192			12,843	7,595	2,950	1,257									10,559	2,240	402	87					25,953	10,984
Kirindi (Buvuma)	2			19,773	11,576	4,118	2,883									1,710	265	105,000	960					130,770	15,678
Damba (Buvuma)	4			40,417	8,126	940	708									3,700	685	17,968	174					43,005	9,693
Kibibi (Buvuma)	18			58,856	6,371	5,092	857									9,929	2,132	2,251	449			219	52	77,466	12,037
Lwaje (Buvuma)	12	47,696	1,642	6,324	3,465	301	151									2,900	739							16,741	9,997
Maloja (Buvuma)	4	62	47	1,240	925	30	187	13	9	9	4					8,870	2,196	570	69					10,794	3,388
Kerenge (Buvuma)	5			1,002	784	576	420	21	70							2,062	517	720	149					4,381	1,610
Bulolombe (Buvuma)	1			3,900	2,808											1,400	253							5,300	3,122
MASAKA																										
Bukakata (Sese)	9	263	170	344	865	18	30	6	4	83	175							50,191	320			40	10	51,140	1,785